September 1976

Smithsonian

Libertad, Argentina

British frigate firing starting gun

The way of tall ships under sail
(see back cover and p. 40)

The timelessness of classic design.

A look, centuries old that has never seemed newer—17th and 18th century country French bedroom, dining, and occasional design interpretations of classic elegance and contemporary adaptability, Henredon's Four Centuries. Here, a handsomely carved armoire can accommodate TV or sound equipment, and the Louis XV-style cocktail table folds out for gracious entertaining. Companions in versatility, are beautiful upholstered pieces that can be made to a custom length to meet individual requirements and covered from a fabric selection that pleases the most particular decorating palette. See the many options of Henredon's Four Centuries and Upholstered Furniture Collections, by sending $2.00 to Henredon, Dept. S-96, Morganton, North Carolina, 28655.

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Look at your car. It's either front-heavy or rear-heavy. Either way, it's unbalanced. With a front-heavy car, it's a struggle to take a corner. Turning a rear-heavy car, the lighter front end can respond too fast for good control, because the heavier rear wants to go straight.

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$7,235* is uncommonly reasonable for a car with standard features like fuel injection, 5-speed gearbox...and DeDion rear suspension. This remarkable suspension holds the drive wheels perpendicular to give the tires full adhesion to the road for sure-footed traction and superb road-holding.

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Alfa Romeo

*EPA ratings. These are only estimates. Actual mileage will vary depending upon type of driving, driving habits, condition of car, optional equipment. 1976 manufacturer's suggested retail price P.O.E. East $7,235; West $7,315; California $7,425. Options, inland transportation, dealer preparation, state and local taxes additional. Ask your dealer about money-saving overseas delivery.

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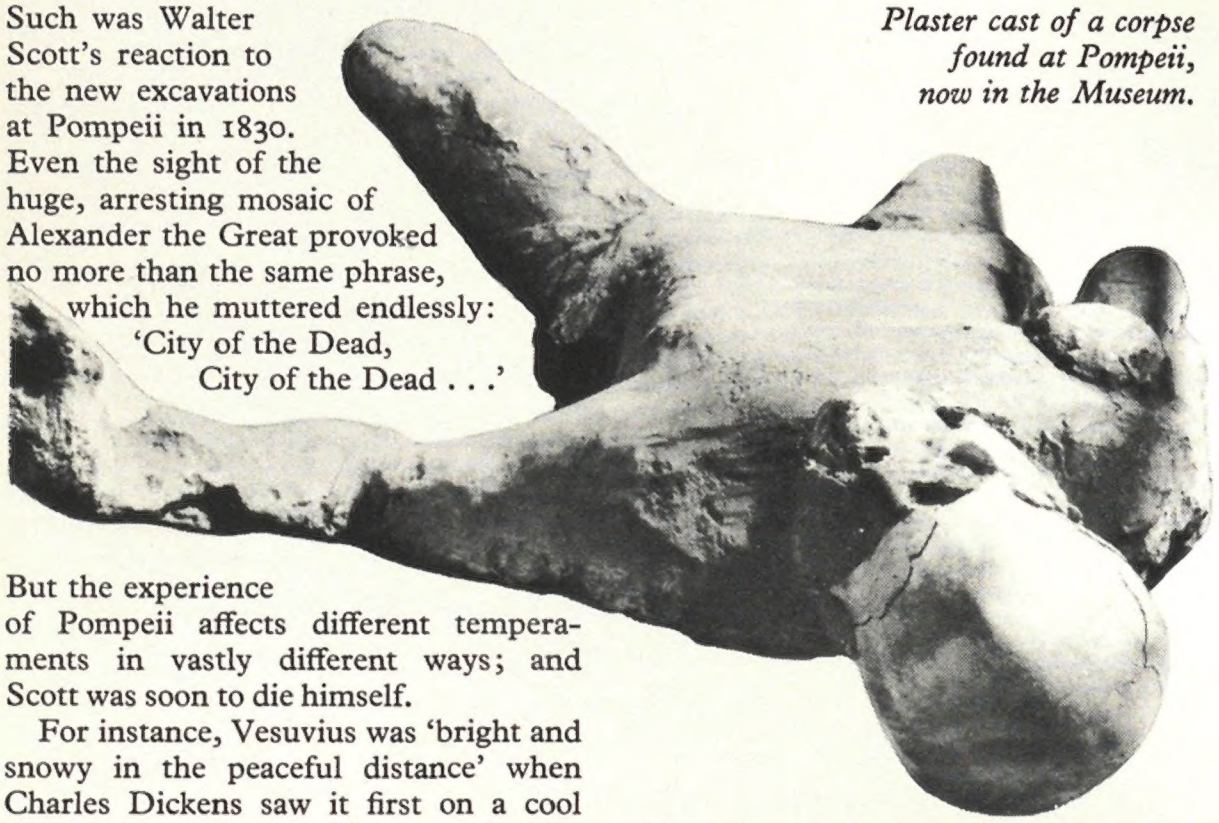
'City of the Dead, City of the Dead . . .'

Such was Walter Scott's reaction to the new excavations at Pompeii in 1830. Even the sight of the huge, arresting mosaic of Alexander the Great provoked no more than the same phrase, which he muttered endlessly: 'City of the Dead, City of the Dead . . .'



Plaster cast of a corpse found at Pompeii, now in the Museum.

But the experience of Pompeii affects different temperaments in vastly different ways; and Scott was soon to die himself.

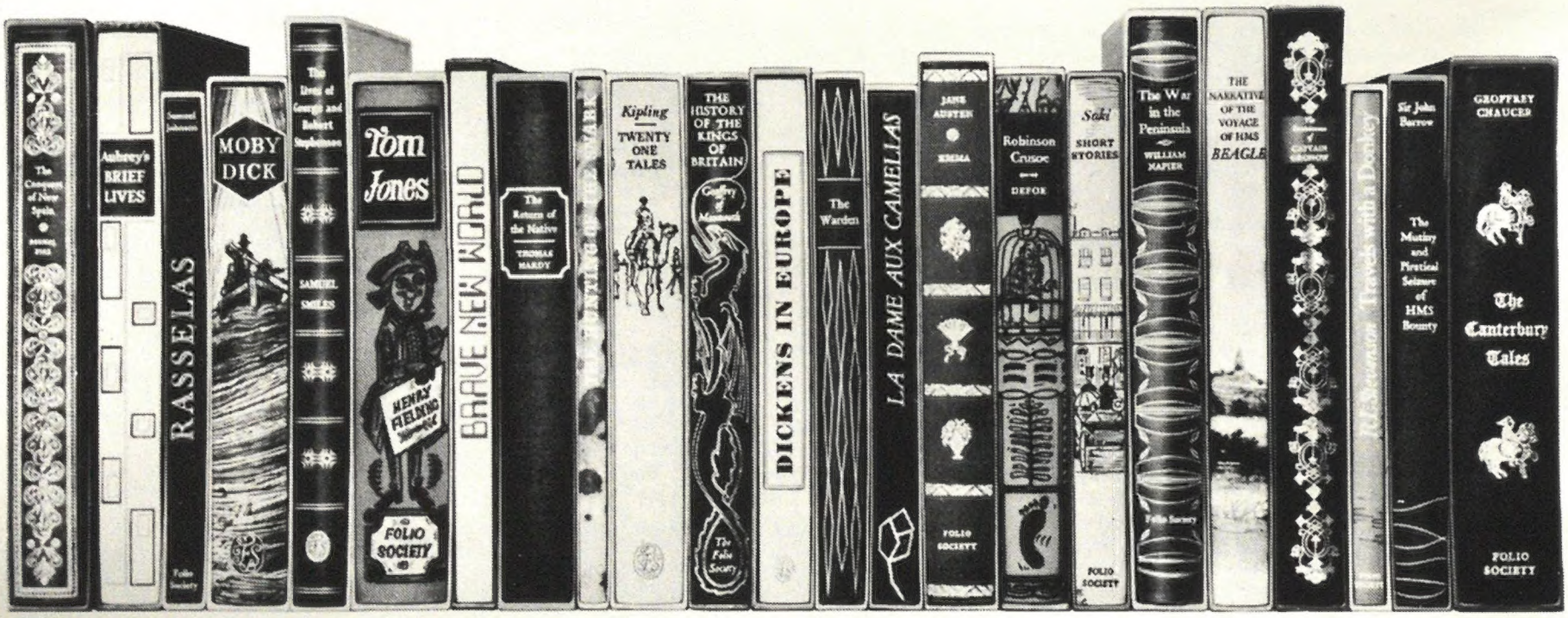
For instance, Vesuvius was 'bright and snowy in the peaceful distance' when Charles Dickens saw it first on a cool spring day in 1845. He instructs the visitor to stand in the forum of Pompeii and admire the volcano through the columns of The Temple of Isis; seeing it as a thing of beauty, not just as a thing of 'doom and destiny, biding its terrible time.'

A thousand years before Christ a fearful eruption had deposited ash and dust as far away as Avellino and Benevento, seventy miles away. By AD 79, the memory had vanished, and the shadow of Vesuvius fell on a busy, slightly raffish town of some twenty thousand souls, about as big as Andover, Massachusetts today. Along the beautiful Bay of Naples stretched a Costa Brava-like string of luxury villas which made the whole coast seem like a continuous town.

The eruption started around one o'clock on 24 August with the appearance from the mountain of a cloud of unusual shape and size—'like a pine tree,' said Pliny, observing from the other side of the bay. Curiosity aroused, his uncle, the admiral and scientist, set off by boat to investigate: Pliny went back to his books. Nearer the mountain, though daytime, it was as though 'the final endless night of which we had heard had come upon the world. The admiral died in the sulphurous fumes 'looking more like a man asleep than dead'. Earthquakes shook the ground 'so that the chariots we had ordered were so agitated backwards and forwards that we could not keep them steady'. Buildings tottered and fell. Storms of ash and stones rained down. Panic-stricken crowds attempted flight in the lurid darkness. 'The sea seemed to roll back on itself so that the shore was considerably enlarged and several sea animals were left upon it. On the other side, a black and dreadful cloud, broken with rapid zigzag flashes, revealed behind it variously-shaped masses of flame'.

Then for sixteen hundred years the shadow of Vesuvius fell on a silent, unpeopled city, its life arrested like an abruptly-frozen film. Today the same dominating shadow falls on the greatest tourist attraction of the Western World. The turn of fate which revealed the lost cities of Pompeii and Herculaneum began in 1710 when a peasant digging a well, struck costly marbles from the theatre of Herculaneum. The discoveries ushered in a Neo-classical revival which

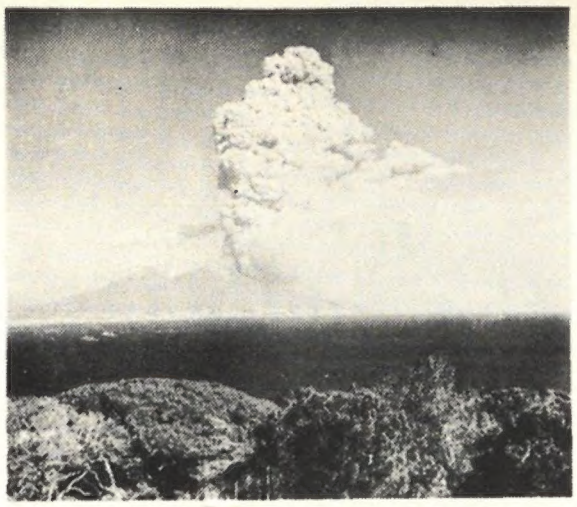
Beautiful Books *interesting reading . . .*



in the two centuries that followed produced a revolution in artistic taste; and affected furniture, decoration and art in the whole civilised world.

Raleigh Trevelyan's narrative *The Shadow of Vesuvius: Pompeii* AD 79 gives a striking personal impression of this ghostly city where, in Shelley's words, one hears 'the autumnal leaves like light footfalls of spirits passing through the streets'. He gives, too, an entertaining history of the slow striptease of time which gradually, tantalizingly, revealed one of the biggest storehouses of treasure the world has seen, the source of much of our knowledge of daily life in the Roman world.

A fine book. *John Letts*



The last eruption of Vesuvius in 1944.

Four Complaints about The Folio Society

It takes a little while to adjust to the unfamiliar. Several thousand book lovers in the United States have made that mental leap in recent years, and now belong to a distinctly unusual organisation which is neither book club nor publisher, but a little bit of both.

For instance, it does not mass-produce huge editions by photo-offset. Nor does it lure you into buying on credit, use a computer system for mailing or billing, or despatch 'selections' which you have forgotten to say you did not want.

Most eccentric of all, it pays *all* your mailing costs from London, England – wherever you live: West Coast or East Coast; Plains, Georgia or Prudhoe Bay.

Even the complaints it receives are unusual. Here are some samples.

W.M.M. of North Andover, Massachusetts, complains that 'I have some fifteen thousand volumes crowding my shelves . . . But I love John Aubrey so much I cannot resist a new edition of *Brief Lives*. Every year you publish something I want, even though I am overloaded with books.' That is why we balance our list so carefully from the by-ways *as well as* the highways of literature and history.

W.K. of Northport, N.Y., complains: 'The advertisements are clever . . . they presume a great conspiracy is spreading untruths about The Folio Society.' We deny any intention to deceive. We err – or *try* to err – in the direction of making advertisements as interesting to read as the newspapers and magazines they appear in.

A.S. of Flossmoor, Illinois, complains: 'I like your service. I like the way you send me the wrong book sometimes (and then write a nice letter of apology) – it adds a nice touch of un-computerised humanity.' Avoiding computers doesn't render us immune from making mistakes –but if we do, we correct them politely and speedily.

A.V.H. of Minnesota complains: 'Mail delay is a growing problem here in the US, but nothing more you can do about this—we have been fighting the battle for a century without success.' Enough said. We do find, however, that international parcels often reach members *more* quickly than internal US mail parcels.

Members join The Folio Society in fact for a variety of reasons – because they like the civilised atmosphere, because they like good book design . . . but mainly because they like the books. They are interesting to read, attractive to look at, and modestly priced (the average price is still only a little over $11.00 post free, complete with slipcase). And you don't have to cross the Atlantic to look at them. Today you can see all the 120 or so titles in the list at The Folio Gallery in midtown Manhattan, (just off Park Avenue, at 113 East 55th Street) where you can browse among five times as many books as you see here, and purchase on the spot if you wish.

To join, you need choose only four. And you get free, as a bonus, *The Shadow of Vesuvius*, reviewed on the opposite page. You also get, for a nominal payment, a 36 page quarterly literary magazine with articles by writers such as Rosamond Lehmann and Pamela Hansford-Johnson.

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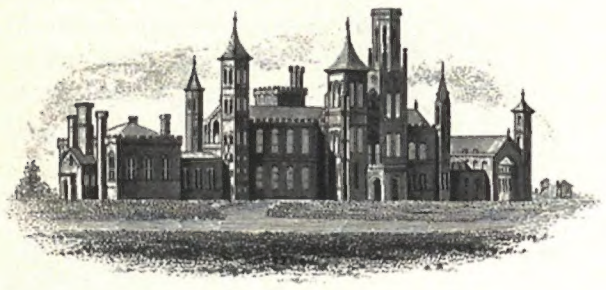
Secretary Ripley's comments

The view from the castle



England is handsomely observing our 200th anniversary with some great exhibitions portraying the events and tragedy of the time

In this Bicentennial season we are not alone in celebrating the event that, 200 years ago, created the Republic. A felicitous aspect of the anniversary of which all Americans should be aware is the year's reverberations abroad. As "the shot heard round the world" took two months to reach England in 1775, so it has taken us a little time to realize that magnificent events are being held this year in England.

At the Victoria and Albert Museum in London there is a marvelous exhibition entitled *American Art: 1750 to 1800, Towards Independence*. Splendidly mounted and meticulously documented by Yale University specialists in the American arts under Professor Charles Montgomery's direction, the exhibition contains paintings by Benjamin West, furniture from Boston and Philadelphia, ceramics, glass, silver and textiles. There are other fine examples of Colonial American creativity on view at the American Museum in Britain near Bath. There are in London itself trinkets to buy from mugs to T-shirts, all representing the British version of what we call Yankee ingenuity. Never underestimate the ability of any of us, on either side of the water, to take advantage of an opportunity to coin an honest 50 pence.

But what to me has seemed the epitome of the celebration abroad is the superlative exhibition at the National Maritime Museum at Greenwich. Labeled *1776, The British Story of the American Revolution,* it is superbly worth a visit (see August SMITHSONIAN). Of all the efforts on our side of the ocean, it seems to me that few have such an impact, or convey so well a mood and, by indirection, a message. Most of this year's special art museum exhibits in America are in effect great assemblies of objects. This is one principle of exhibition. Simply collect the objects, display them and let them speak—preferably to those with inner qualities of appreciation. Unfortunately, these elitist assumptions must usually be bolstered with a catalog, and so a vast volume is often prepared at considerable expense which, like a gazetteer, tells one where one is but not why.

Not so with *1776*. This exhibition, perhaps because of its relative concentration on a year and an event, manages to pack an immense amount of thought-provoking information into its theme. To view it is to realize the magnitude of the division between the Colonists, the fear of reprisal, the compulsion of the time, neighborhood esteem, the opinions of one's peers, the struggle of conscience, the love of property.

To be a Loyalist then was to be on the side of the established order. Once the shot was fired, and the occupying forces drawn up, not only as *authority* but also as *enemy*, the personal trauma that ensued in 1776 is dramatically displayed. The eventual plight of the Loyalists, and the blacks who joined them, hoping to escape from slavery, becomes a graphic force. Few Americans, I think, so visualize the events and the resulting divisions and tragedy of the time. All Americans who visit England this fall should see these exhibitions, even as the British are thronging in. For in *1776*, especially, there is much for everyone of us to learn, to sense and perhaps to understand in our Bicentennial year.

S. Dillon Ripley

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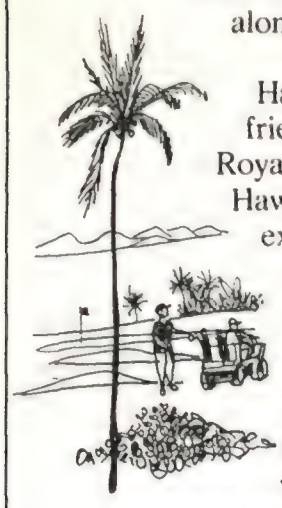

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Phenomena, comment and notes

Gentle names for the small cars, body clock again, cat fleas, and energy sense can save dollars

Until banks and other fiduciary institutions get interested in energy conservation, it will continue to be an idea more talked about than acted upon. Energy costs money but so does saving it.

There has recently been what the press would call a breakthrough in this sphere. The Seattle Trust and Savings Bank announced last July that it was inaugurating a new consumer loan program that uses interest rates as an incentive to energy conservation.

The idea is simple. One gets a lower interest rate on a mortgage loan for buying or remodeling a home that scores a certain number of points on an energy conservation chart. The chart, which was developed for the bank by a frequent contributor to these pages, Wilson Clark of Cascadia Institute and the Environmental Policy Institute, gives five points for six inches of ceiling insulation, three points for storm windows, one point for fireplace damper integrity, and so forth. The house must earn 15 points to qualify. Other schedules have been worked out for automobile and boat loans. The interest rate is lower for cars that get 25 mpg or more; small outboards and most sailboats qualify automatically.

It makes sense, and apparently it makes cents for the bank as well.

A cat problem

A debate of considerable acrimony erupts from time to time in this country and abroad about the inappropriateness of maintaining dogs as pets in the city. The arguments are familiar. However, cat lovers have been keeping a low profile and their beloveds have come in for proportionately less criticism, no doubt because they are smaller and, everyone believes, neater.

A salvo has now been fired at the felines, in *New Scientist* (Volume 70, Number 1005). It seems that the Number One household insect pest, in Great Britain at least, may be the cat flea. There is no human flea, but if a cat flea is starved (when Tabby goes hunting?), it will take to humans. This is hard on the flea since human blood makes it nauseated, but in a pinch they will make the sacrifice and, in alarming numbers, do. They are not hosts to any serious disease, but it is possible to get worms via fleas.

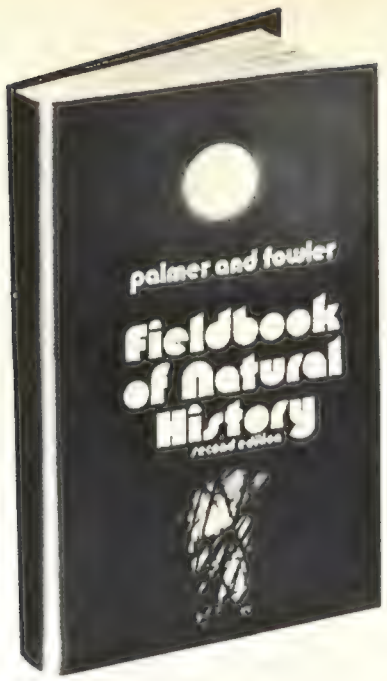
In a household in which a cat has several favored nest sites, the cat may maintain a population of as many as 2,000 fleas. The females lay from six to eight eggs per *second*, and about the only solution is four months of repeated spraying—not just the cat but wherever it goes, an unlikely regimen for most people.

"In the end," says *New Scientist* ominously, "the question of how far keeping cats inside houses is desirable . . . may have to be raised."

Oysters and heavy metal

There was a terrible hullabaloo a few years back about tuna containing unnaturally high levels of mercury in their tissues. Ultimately, it was shown that tuna had about the same amount of mercury these days as it has always had and the flap died down. In fact, the great public hue and cry about toxic heavy metals in general disappeared from the news pages to be replaced by other crises. But, like the mercury in a thermometer, the question looks as though it may rise again. The problem this time is with oysters and the culprit is cadmium.

According to two biologists from the U.S. Environmental Protection Agency, whose report appears in *Nature* (Volume 261, Number 5559), people will suffer from cadmium poisoning if they eat food which contains 13 to 15 parts per million (ppm) of the metal. Knowing that shellfish are supposed to be first-class accumulators of the heavy metal detritus of the oceans, the biologists immersed a bunch



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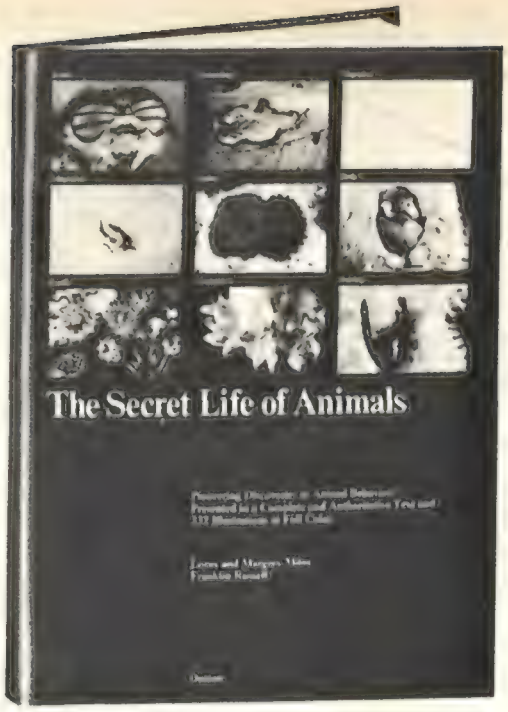

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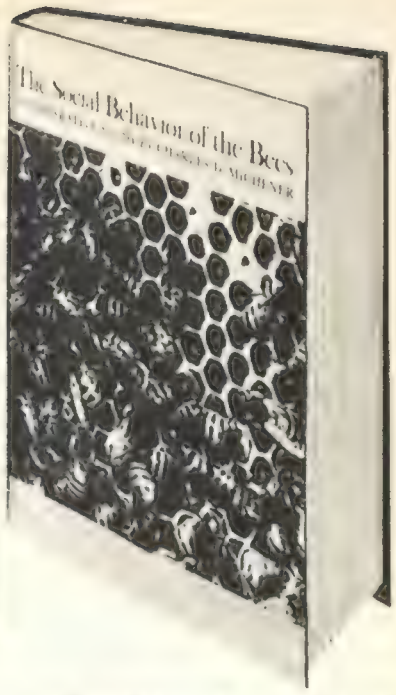

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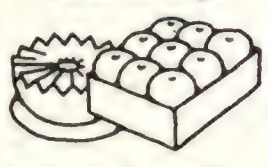

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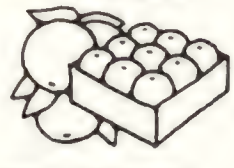

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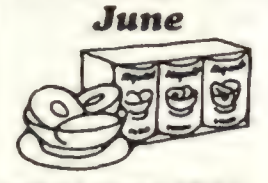

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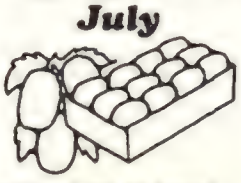

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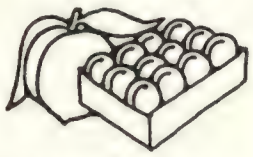

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of oysters in water containing 0.005 ppm of cadmium for a period of 40 weeks. By the end of the period, the hapless oysters had accumulated 10.75 ppm of cadmium and this, added to the amount naturally present, brought the concentration up to 13 ppm—the toxic level.

Now nonpolluted seawater at the sampling site contains about 0.0001 to 0.0002 of cadmium, but the biologists felt justified in testing oysters in water with greater amounts because in so many places where oysters are commercially harvested, industrial pollutants add their share. For example, Corpus Christi harbor contains 0.078 ppm of cadmium.

Oysters sampled along the Atlantic seaboard were found to contain up to 7.80 ppm. While this is below the immediately toxic level, it is still cause for concern since humans absorb some ten percent of all cadmium ingested and retain it for years. "Cadmium," the environmentalists say, "has been implicated as a possible cause of hypertension through damage to the renal cortex."

They do not say what all this cadmium does to the oysters, but the obvious advice for human beings is to eat these creatures sparingly.

Timing

The reason why the carryings on of the jet set often seem so bizarre is probably because their chosen means of transportation produces the well-known phenomenon jet lag, wherein for about a day after changing three or more time zones the mind just doesn't work very well. The matter has been looked into by many researchers, and properly so, since such important folks as Secretaries of State are given to jetting here and there.

But there is a time-zone change that affects far greater numbers of people than jet lag—it occurs twice a year in some 25 countries. It is called (in this country) daylight saving time. When we lose an hour in the spring it is the same as moving one time zone eastward; when we gain an hour in the autumn, it's like a westward move. But, up until now, science has paid little attention to the possible disruptions in behavior that such a wholesale shift in time zone may cause. Now two British psychologists from the University of Sussex have looked into the matter and reported in *Nature* (Volume 261, Number 5562).

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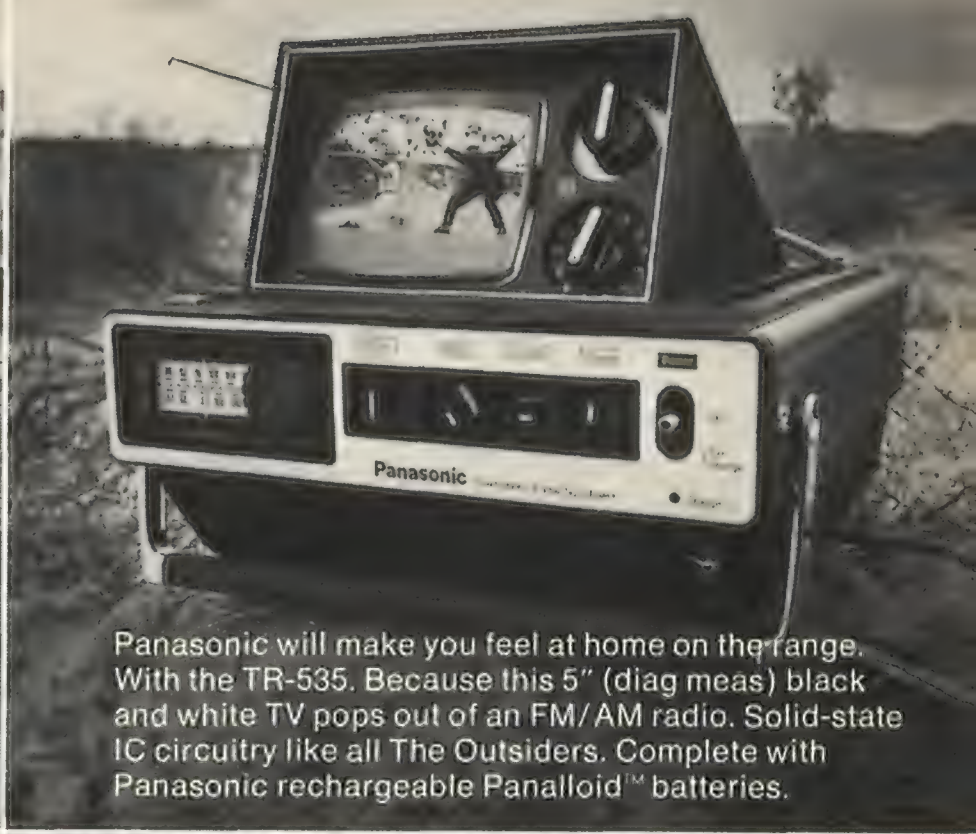

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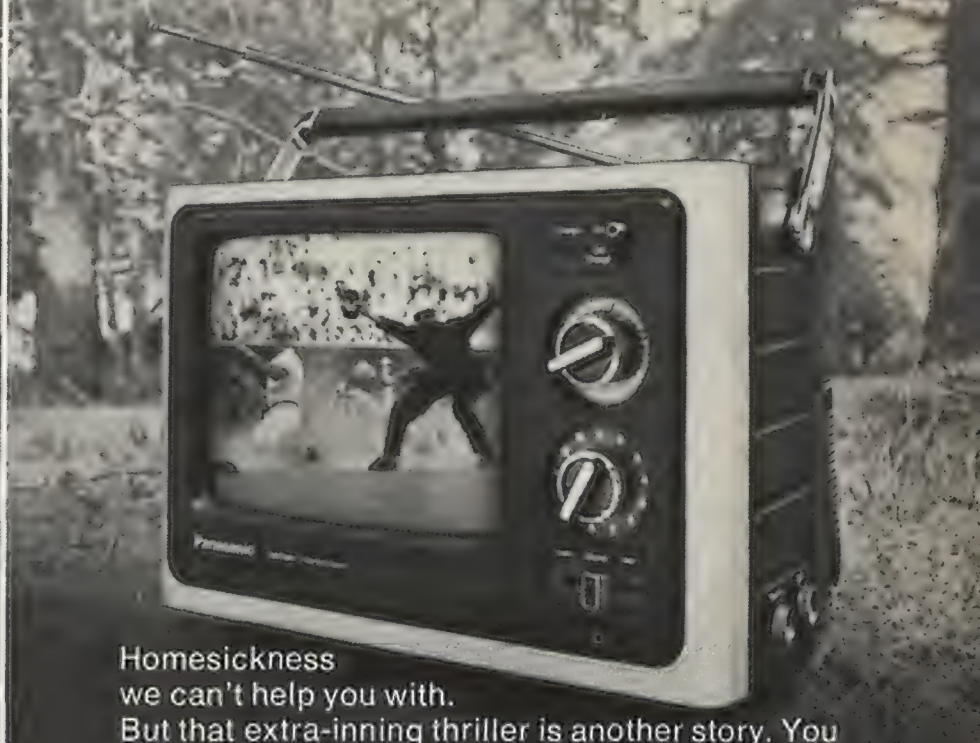

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They studied 65 adults, of whom 55 were women, after the autumnal gain of one hour in 1974. It took five days for the "mean waking time" to adjust to the clock. The subjects were asked to record their own feelings of alertness at 9 A.M. before and after the time switch. Quite naturally, for a few days after the time change, they felt more alert at 9 since they had been up longer. The subjects also experienced a slight rise in body temperature for six days after the time shift. Thus, it takes longer to adapt to the daylight saving time change than it does to a case of jet lag.

Nevertheless, these findings hardly seem alarming. What is ominous is that the psychologists appear to have found a correlation between the switch to daylight saving time (in the spring—similar to flying east) and a rise in the number of automobile accidents.

Spinning wheels

In the film *The Graduate*, a man at a cocktail party took Dustin Hoffman aside and gave him one word of advice as to how to make his fortune: "Plastics," said the man. In a present-day remake of the film the man might say "Flywheels."

The federal government is putting up $1 million this next fiscal year for research into these energy-storage devices, and while that amount seems puny compared to what Uncle Sam is pouring into breeder reactors, it is significantly more than was spent on all non-nuclear alternative energy sources a few years back.

The flywheel is being looked at primarily for transportation applications. There seem to be three ways you could use a flywheel in a car. The most modest is to capture the energy lost when you put on the brakes, and an experiment in this technique is under way with post office electric jeeps.

Another mode is the hybrid, in which a normal internal combustion engine would be used to charge up a flywheel, which would in turn power the car. According to *Environmental Science and Technology* (Volume 10, Number 7), this could increase the internal combustion engine's efficiency from the present 12 percent to 20 percent.

The third mode is the 100 percent flywheel automobile. Lear Motors (an entrant in the race to produce an economical steam car in 1972) has teamed

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with U.S. Flywheels, Inc. to develop it.

Flywheels, it is suggested, could overcome the disadvantages of electric cars—limited range and slow acceleration. Meanwhile, in actual experiments on the New York City subway system, cars retrofitted with flywheels have shown a 30 percent energy saving. If the entire system were so fitted out, it could, by one estimate, save the beleaguered city $20 million each year in the cost of electricity, and that isn't peanuts.

On nomenclature

In his lively book *American Talk* (to be published in September by Random House), J.L. Dillard asks why, in a society that prides itself on its technology, do we drive cars the names of which commemorate "the premechanical days of the frontier?" He cites such names as Bronco, Pinto, Colt, Maverick, Cougar, Falcon and others, and while the question is more or less rhetorical, it does raise an interesting need in American automobile manufacturing.

While most thoughtful people are seeing the need for smaller, energy-saving automobiles capable of less impact on the environment—that is, gentle cars—no one has really followed through with appropriate names. The frontier names suggest speed, power, daring and masculinity. A German manufacturer may have the right idea with its Rabbit—though even this is probably meant to suggest speed, not the image of Bambi's friend Thumper. But can the Tortoise, signifying reliability, longevity and safety features that would make Ralph Nader shiver with delight, be far behind?

Consider a small electric for city commuting known as the Buick Butterfly, and a competitor, the Plymouth Ladybug. A car with an energy-storage device such as a flywheel might be called a Pelican; a suburban station wagon cries out for the name Meadowlark. Of course the ecological approach could go too far: imagine Mack Trucks coming out with a sanitation vehicle known as Turkey Vulture.

Perhaps the Environmental Protection Agency should, in league with an advertising agency, test out the reactions of Americans to find out what the most endearing little animals are—chipmunks, fawns, robins, chickadees? Ah, if Walt Disney were still with us in person.

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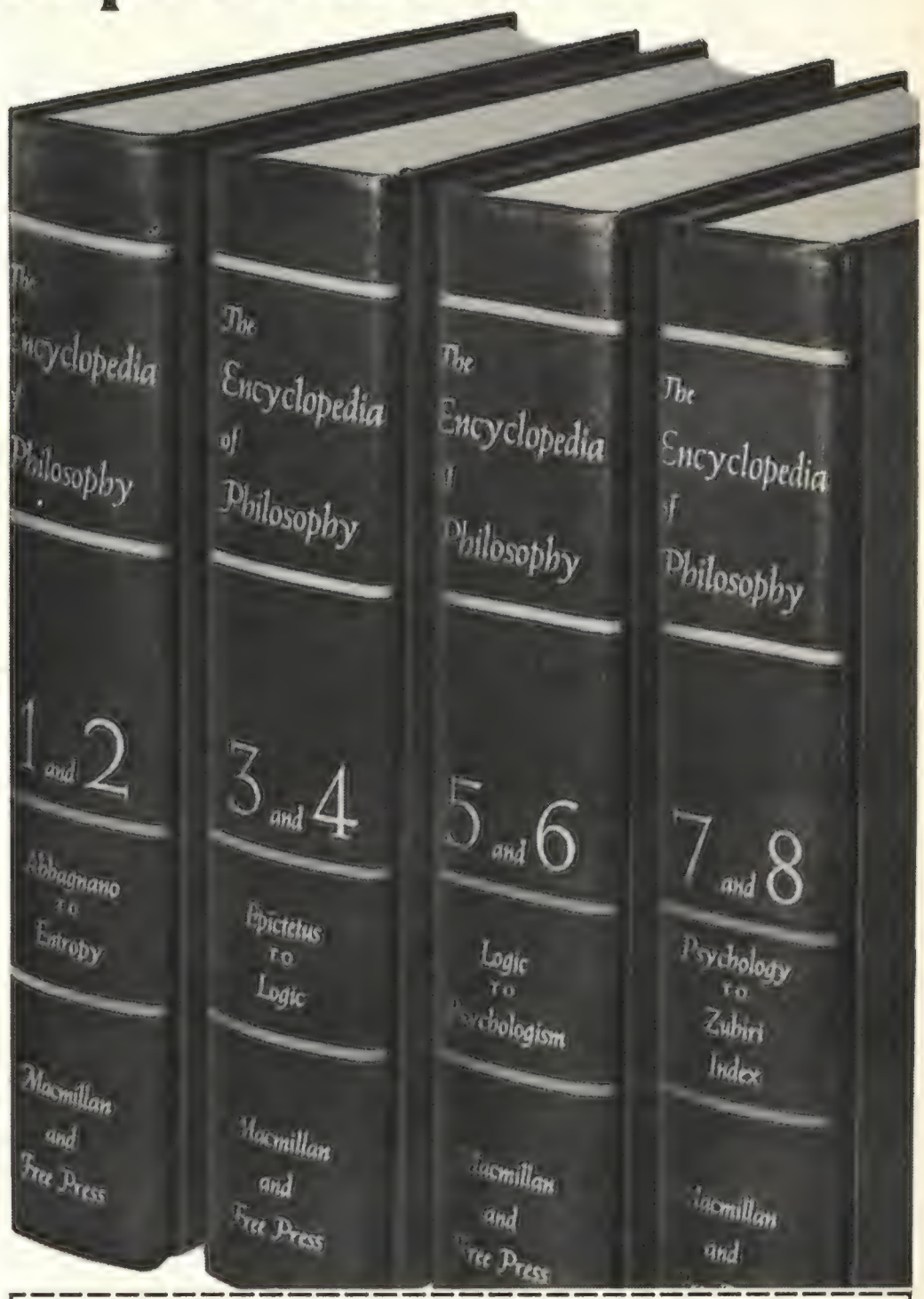

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Letters to the Editor

Special issue

Dear Sir: The foresight of the original planners of SMITHSONIAN indeed deserves credit. The decision to commence publication in April 1970 has resulted in your July issue, the Bicentennial month, not only being Volume 7, Number 4 but also your 76th issue. A more appropriate way to commemorate the glory of the 7-4-'76 date can scarcely be matched.

Ira Hecht
Austin, Texas

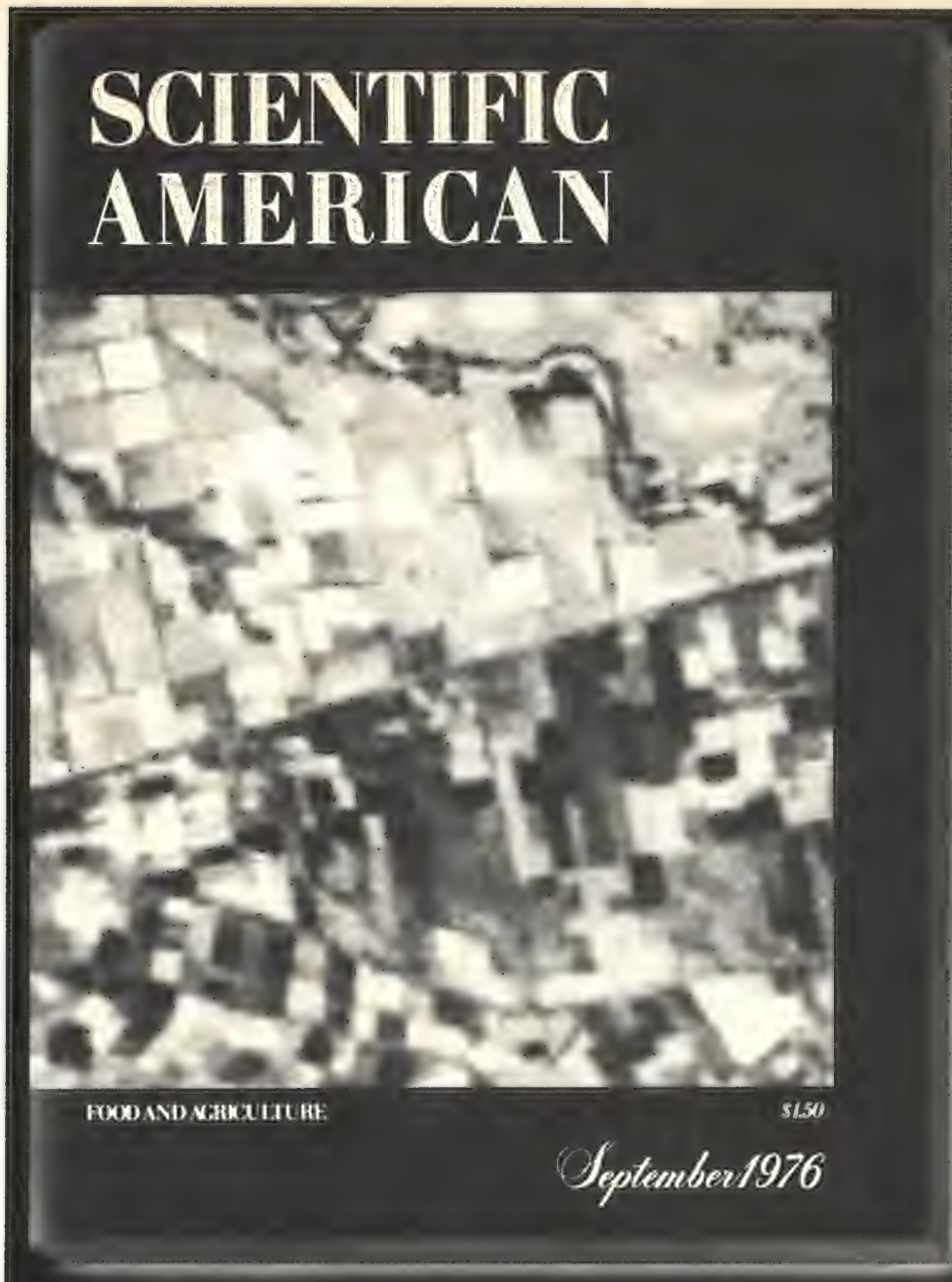
It is a happy coincidence, rather than a matter of foresight. Ed.

National spirit

Dear Sir: Rod MacLeish's article, "National spirit: the pendulum begins to swing," offers a well-taken portrait of Americans seeing ourselves as "special in the eye and intent of God," but he should have avoided "the vision of Eden." Humankind were not expelled from Eden for what they had done but for what they might do if allowed to remain in that place of infinite possibility.

It was not because mortals had eaten "from the tree of the knowledge of good and evil" (Genesis 2:17), but "lest he put forth his hand, and take also of the tree of life, and eat, and live for ever" (Genesis 3:22). The expulsion was primarily prevention rather than punishment. Removal from the garden came essentially to maintain humanity's mortality.

God was very realistic at this point. The ultimate dream of mortals has been to escape mortality, to discover the fountain of youth, to live forever. Christianity teaches that this has come to us only as



Three billion more people will join us at the dinner table between now and 2000 A.D.

How in the world will we feed them?

That question provides the occasion for the publication of the September issue of SCIENTIFIC AMERICAN, devoted in its entirety to *Food and Agriculture*. The answers come from a distinguished group of authors who are otherwise engaged in implementing their answers in the laboratory—and in the gardens, greenhouses, rice paddies, croplands and ranges of the world.

Pundits and publicists have put abroad a great deal of misleading information on this subject. There is wide acceptance of the proposition that the exploding populations of the poor ("underdeveloped") countries have overrun their agricultural resources. The "lifeboat ethic" instructs the people of rich ("developed") countries to be ready to repel boarding parties.

In fact, the peoples of the underdeveloped countries have outgrown not their resources but the subsistence-agriculture technology that has held them in misery from the dawn of history. The demonstrated agricultural technology of the industrially developed countries could multiply world agricultural output by more than a dozen times. It could support a well-fed population of 40 billion. This is a much larger number than that at which, it is now reckoned, the world population will stabilize some time in the next century.

What is required is the transfer of modern agricultural technology from the developed to the underdeveloped countries. That is the answer to the 2000 A.D. question. The fact that it is now technologically possible to banish hunger from human experience carries immense force against the political, economic and social obstacles that stand in the way.

For regular readers of SCIENTIFIC AMERICAN, this September single-topic issue supplies the latest installment in a continuing story. Starting in 1950, with "The Food Problem" by Lord Boyd-Orr, this magazine has reported step-by-step the revolution in agricultural technology that helped to double world food output in the years since.

Our readers have kept abreast of all the other developments in science that have made this period the most momentous in intellectual history. Consider what has occurred: the unlocking of the genetic code; the discovery of continental drift; the proof of uncertainty in logic; the recognition of the role of toolmaking in our biological evolution; the sudden arrival of solid-state electronics, the microcomputer, the laser; the elucidation of the nerve circuitry that organizes perception; the penetration of the structure of the fundamental particles.

To our readers all this has been reported by the scientists who did the work. (More than 60 Nobel prize-winners have written for SCIENTIFIC AMERICAN, nearly all of them in advance of their recognition by Stockholm.) The collaboration of our editors in the preparation of text and illustration makes this work accessible to a growing worldwide readership.

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a gift of God through Jesus Christ. This gift God has reserved for himself to give.
Clair D. Siple
Minister, United Methodist Church
Bemidji, Minnesota

Dear Sir: I was saddened by Rod MacLeish's description of Marxists as part of a general group of antiwar "crazies." Many intelligent and compassionate people use Marx's economic, social and political model to help visualize and investigate the American scene.
Frank L. Balzer
Jefferson City, Missouri

Dear Sir: The photograph of the memorial to Henry Adams' wife is described as symbolizing the "foreboding that Americans have felt about modern times." I prefer Saint-Gaudens' notebook description of "Calm reflection in contrast with the violence or force in nature" and "Mystery of the Hereafter . . . beyond pain and beyond joy." However, in art, I suppose everyone sees it in his own way.
Francis G. Burke
Modesto, California

Plutonium

Dear Sir: Peter Gwynne correctly calls attention to the danger of using plutonium as a fuel source although, as he points out, there is *so far* no evidence that a human being has ever contracted cancer from exposure. The Teton Dam disaster [see cartoon below] indicates that even going back to supposedly safe old water power also involves taking chances. Even coal, plentiful in the medium- to short-range, has undesirable side effects. Let us hope that a plan now being advocated by the Arms Control and Disarmament Agency will make plutonium in the waste from nuclear plants virtually unhijackable by terrorists. The plan involves using spent fuel, as is, in reactors of radically different design. We can't go back to the buffalo chip fuel of our westward-bound ancestors.
Thomas Tedson
Chicago, Illinois

Genetic profiles

Dear Sir: As a pediatrician for the past half century, I had a special interest in Maya Pines' article on genetic profiles.

Over the years, I witnessed the control of the major infectious diseases and then shifted my interest to the chronically disabled, the mentally retarded and other syndromes. In many of these conditions, a family history, carefully taken, reveals a genetic basis for the condition, either directly or through susceptibility to environmental factors.

At present in many areas of the United States, health education is the weakest link in our health programs. Every child should have the opportunity to know his body, the different organ systems, how they function, what is injurious to them and the role of genetics in the transmission of some conditions. To accomplish this, teachers must first be taught it and then parents and children.

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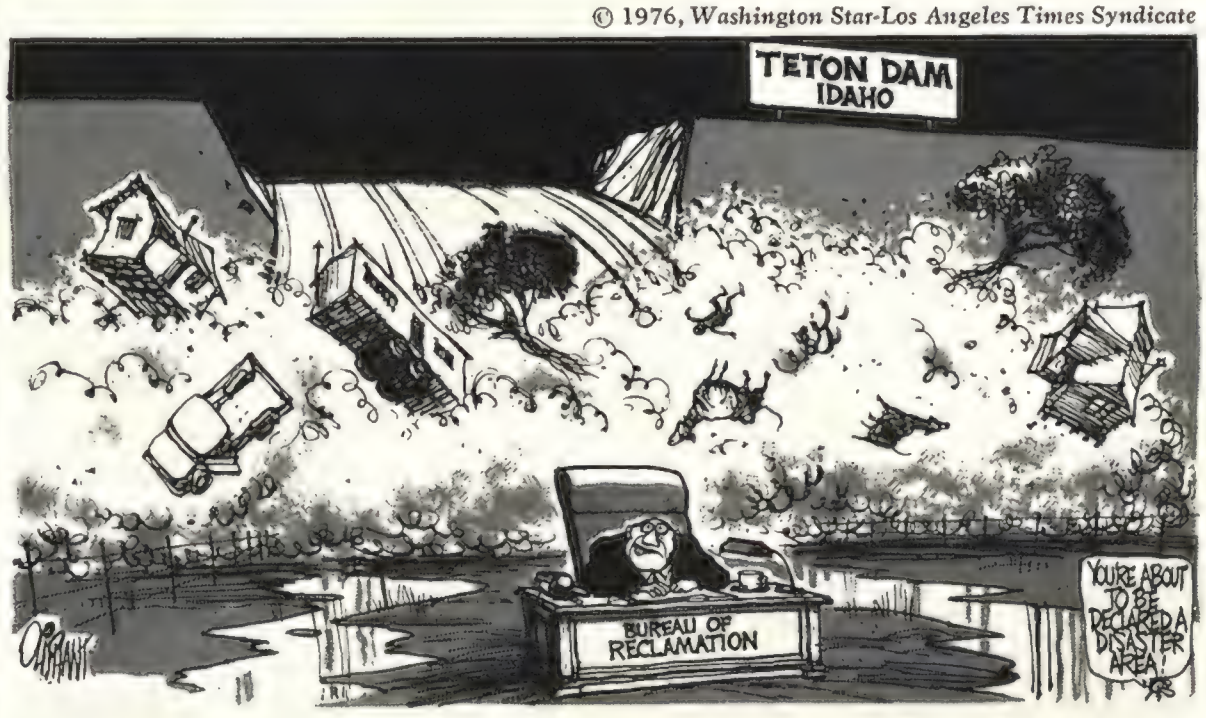

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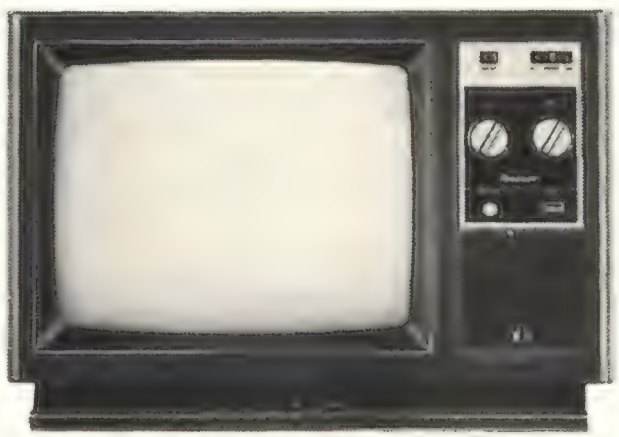

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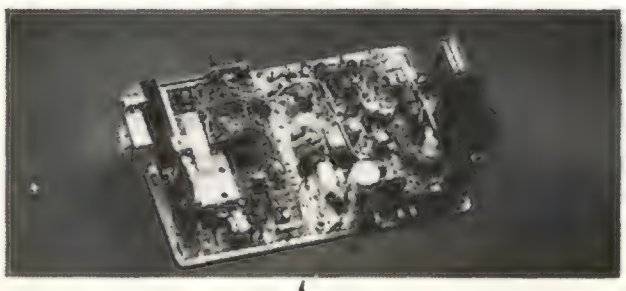

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The abnormal child is no longer "hidden in the closet" but familial diseases often are. There can be no immunization against most of these conditions, and mending the genetic pattern will not prevent the transmission of the condition to the offspring. Knowing something about genetic profiles should be a must.
H. E. Thelander, M.D.
Tiburon, California

Atlanta renewal

Dear Sir: As a long-time neighborhood activist in Atlanta, I greatly enjoyed Charles Little's article on our neighborhood movement. The key element in our success was the political clout which enabled us to influence the new City Charter, stop five major expressways, and elect a mayor, council and Congressman on neighborhood preservation platforms. Our coalition efforts cut across racial, economic and geographical barriers.

We strongly believe that the salvation of American cities lies with their revitalization as places to live through the preservation of in-town neighborhoods. We hope your article will inspire urban residents in other cities.
Virginia Taylor
Vice Chairman, Atlanta Coalition on the Transportation Crisis
Atlanta, Georgia

Big and/or little?

Dear Sir: In connection with Wilson Clark's article, "Big and/or little? Search is on for right technology," we believe that Very Large Crude Carriers (VLCCs) represent advances in design, construction and operational procedures which have benefitted large tankers perhaps more than any other class of ship in modern times. In view of their superior safety and pollution-prevention record, and the energy savings they achieve, Exxon believes that large tankers do indeed represent the "appropriate technology" for transporting over long distances the oil essential for our economy.
R. E. Lyon jr.
Exxon Corporation
New York City

Dear Sir: After reading hundreds of articles in magazines and newspapers during the last year concerning the environment, politics and the economy, I find

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Corinne K. Cronlund
Susquehanna, Pennsylvania

Telecommunications

Dear Sir: Your article on the telecommunications future of our country reminded me of the articles published in the late 1950s forecasting the wonderful world of computers. Alas, most of those articles were naive concerning the possible future of telecommnications.

It is perhaps ironical, but it is nevertheless germane, that the Federal Communications Commission, the agency charged with the responsibility for achieving that future, is at this point engaged in attempting to defeat legislation (HR 12323 and S 3192) which could virtually eliminate the free competition essential to implementing most of the features discussed in your article. In part, the FCC states: "Congress is now being asked to delegate fundamental social and political decisions as to who subsidizes whom, and to what extent, to the unreviewed discretion of the telephone industry. Thus, the practical result of the proposed legislation is not just to stop competition, but to produce an ineffectively regulated telephone industry monopoly of communications services and facilities."

James H. Scott
Carterfone Communications Corporation
Dallas, Texas

Dear Sir: Life with "telecommunications" will be much like life with television today. Each evening millions of Americans will be tuned-in to their screens, oblivious to everything around them, just as many people today apparently cannot "live" without their television.

The ultimate question to Man's ultimate folly is a moral one: "Will the people who produce these technological wonders be responsible for the bad which may result from them as well as the good?" In an age of permissiveness and "anything goes," it is worth pondering the technological morality (or immorality) which ensues from all things we label as progress.

Charles A. Kulig jr.
Notre Dame, Indiana

100 years later, the wounds still bleed.

The Civil War

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As the weary (Union) artillerymen passed silently out of the harbor, Confederate soldiers lining the beaches removed their caps in salute. There was no cheering.
—Volume I, Fort Sumter to Perryville.

Here the great Stonewall Jackson, accidentally wounded at Chancellorsville, gives his last orders:

He left the sentence unfinished, seeming thus to have put the war behind him; for he smiled as he spoke his last words... "Let us cross the river," he said, "and rest under the shade of the trees."
—Volume II, Fredericksburg to Meridan.

And here a nameless foot soldier defies an order, during the Confederate retreat from Nashville:

"You go to hell—I've been there," the man replied, and kept on trudging southward in the rain. None among them had any way of knowing that the war's last great battle had been fought. All they knew was they wanted no more of it...
—Volume III, Red River to Appomattox.

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Science and technology

Dear Sir: Daniel S. Greenberg's article brings out clearly a real tragedy of current U.S. science, this being the restraints on one of our most precious resources, so-called "Yankee inventiveness."

This has an overriding importance in 1976, not awaiting 2001, for in the present polarized debate on nuclear safety the superorganized sectors of nuclear science answer criticisms of their stance with cries of "nonsense" and "having bad dreams."

All other areas of science have in the past 25 to 30 years engaged in an information explosion. Not so, nuclear science. The very basic unstated assumption in all calculations and projections of nuclear safety as now applied to weaponry or power installations is that presently accepted concepts define all possible parameters of all nuclear interactions.

We do not have the time to permit the normal, slow processes by which scientific concepts mature and are accepted, for scientists let the genie out of the bottle in 1945 and it is not going to crawl back in the bottle. For better or worse, as we stir the glue that holds Spaceship Earth together, old-fashioned scientific method is going to have to be brought out of the dustbin of outmoded clichés.

H. C. Dudley
Professor Radiation Physics
University of Illinois
Chicago, Illinois

Phenomena, comment and notes

Dear Sir: I was rather amused to read James K. Page's report on the findings of a group of Columbia University social scientists about child rearing. This study simply says the same thing three ways: parents who spank their children produce kids who fight a lot; an excitable mother will cause her children to fight with their parents and their brothers and sisters; cold parents are asking for conflict between the child and its parents and siblings. In other words you are damned if you do and damned if you don't.

Perhaps the scientists are viewing the problem from the wrong perspective. It could be that sibling rivalry is the normal way a child finds his place in the world.

Mrs. Linda Burhenne
Willoughby, Ohio

"Pollution" is a dirty word. So is "unemployment."

All of us want to live in a clean environment, as free from pollution as possible. And all of us want to live in a prosperous America, with jobs enough for everyone.

At Bethlehem, we're working very hard to achieve both. But corporations have to budget their resources just as families do. We can't do everything we'd like to do, and we can't do everything at once.

For example, it's expected that our country is going to need a lot more steelmaking capacity—about 30 million added tons by 1983.

Gearing up to meet that anticipated demand would (1) help maintain jobs in the steel industry, and (2) create jobs for thousands and thousands of people in other industries—in construction, in equipment manufacturing, and in scores of service industries.

But expansion of this magnitude takes vast sums of money. And over the past inflation-recession years, we just haven't been able to generate enough money to do that job.

So we had to make a tough choice. We had to "stretch out" the completion of a number of expansion projects we had under way. That cost people jobs.

One program we had to continue: pollution control

So far, Bethlehem has spent approximately $400 million to clean up a major portion of the pollutants from the air and water we use. In an effort to meet existing laws and regulations, we have many more projects under way or anticipated in the near future. Cost? About $600 million over the next five years.

Is there any relief in sight?

Depending upon how far regulatory agencies go in stringent interpretation of the present laws and regulations, we may be faced with spending hundreds of millions more to try to remove the last traces of pollutants. We do not believe that this would be money well spent.

Attempting to remove the last increment of pollution involves new and uncertain technology. The attempt will consume a considerable amount of scarce energy and natural resources. And, in many cases, it will merely transfer pollution problems to the power companies or chemical manufacturers.

Is it time for a rearrangement of priorities?

We are faced as a nation with troublesome alternatives. Do we continue our headlong rush to implement some of the air and water clean-up standards that have yet to be proved necessary—or even sound—or shall we give equal consideration to jobs, our energy requirements, capital needs, and other demands for social priorities?

We believe the national interest now requires that we face up to the dual necessity of preserving our environment while at the same time assuring economic progress.

Our booklet, "Steelmaking and the Environment," tells more about what we're doing to help solve the problems of pollution. For a free copy, write: Public Affairs Dept., Room 476-S, Bethlehem Steel Corp., Bethlehem, PA 18016.

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Or they invest in "magnificent mediterranean fruitwood stereo consoles" which may be easy on the eyes but are generally a blight on the ears.

Some people pick up nifty all-in-one stereo compacts they believe will give them good, high-fidelity sound. But a visit to a reputable high-fidelity dealer will quickly shatter that belief. Because only there will you hear *true* high fidelity and come to realize just how inadequate everything else is.

The simple truth is that only real high fidelity will give you real high-fidelity sound. That means separate component pieces; receivers, turntables, tape decks and speakers, each designed to do its job perfectly.

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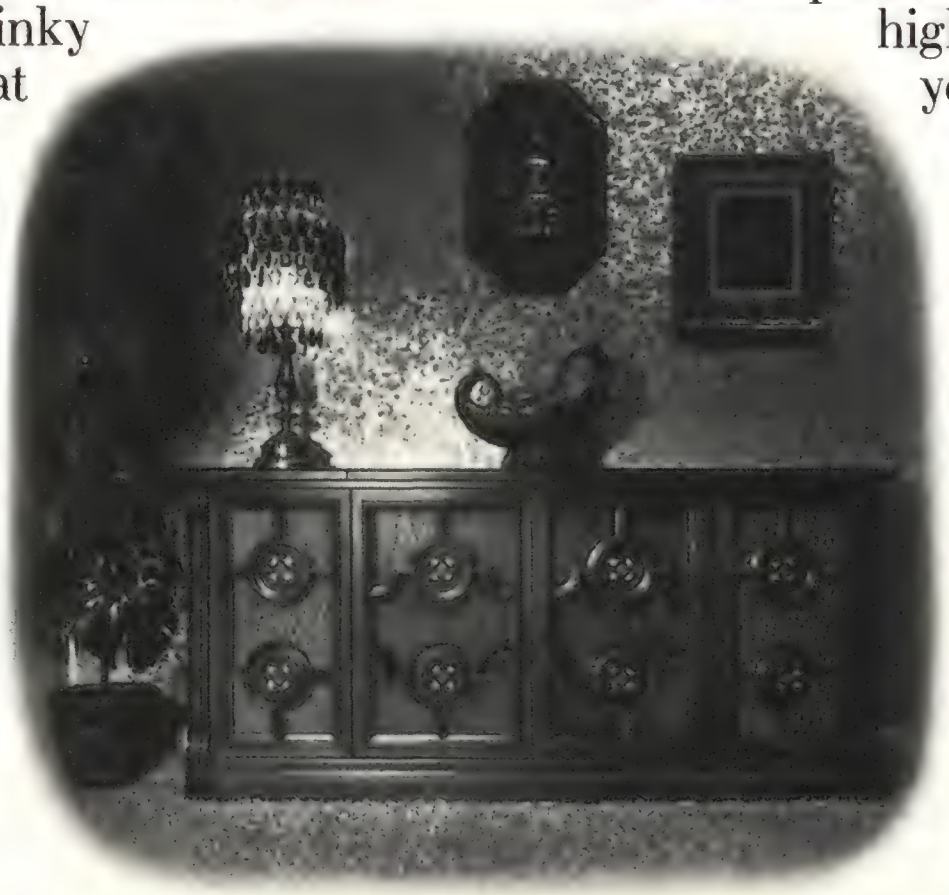

The $900 worth of fruitwood looks good. The $200 worth of electronics sounds bad.

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Around the Mall and beyond

Queen Elizabeth, with Secretary Ripley as her guide, views a model of "The Federal City."

Our Bicentennial has lured a spate of foreign dignitaries to the United States, and the Smithsonian Institution has given a hearty welcome to most of them. Like the millions of everyday sightseers who visit our museums every year, these crowned heads and prime ministers are drawn to our displays. But the difference between a VIP and a tourist is clear.

The potentate's tour is of brief, prescribed duration. He or she is led by the proper greeters to a few specific displays—things that are interesting to the ruler and which also fall within the demands of security.

The tourist, in contrast, wanders happily at will, gazing at everything, lingering in front of something that intrigues him, spurning something else that bores him. He stays all morning if he feels like it, then steps out on the Mall to chomp down some popcorn and gooey ice cream before hitting another museum later in the day. He may come back tomorrow if he doesn't have to head home to Albuquerque or Cleveland or Des Moines.

The tourist has that advantage over Queen Elizabeth. She—our most recent royal guest—arrived at the Smithsonian castle exactly as she was supposed to (*Around the Mall*, July 1976) and was duly greeted by our own institutional dignitaries: Secretary Ripley, Chief Justice Burger, Chancellor of the Board of Regents, and Vice President Nelson Rockefeller, all suitably begowned in their academic regalia.

The Queen was then shown three specific areas: the crypt which holds the remains of our founder, James Smithson, an exhibit in the Great Hall called "The Federal City: Plans and Realities" which shows how Washington has changed over the years, and a few other items on display in the Associates' Lounge.

Queen Elizabeth handled her assignment with smooth expertise, standing properly silent before Smithson's tomb, for, after all, he *was* an Englishman, even though illegitimate. With her was James Smithson's half-brother's great-great-great-great-grandson, the Duke of Northumberland, come to visit his friend, Secretary Ripley, and point up the family interest in the Institution.

Queen Elizabeth's appearances are traditionally the best engineered in the world. They click off like clockwork. Sometimes it is hard to realize that the pretty little lady in the big royal hat who walks sensibly into a room, surrounded by tall and respectful men, and looks at various things with a sort of determined interest, is really a warm-blooded human being. I was near her in the castle when Secretary Ripley (who towered decorously above her) made some lighthearted remark. And she turned and looked up at him with a warm and nicely naughty smile. She has kind of a generous mouth and when she smiles she lights up and turns into someone you feel you'd like to know better. I had trouble restraining myself from suggesting to her that I knew a nice quiet place around the corner and would she like to bust away from all this and come and have a quick one?

After this appearance at the castle, Queen Elizabeth went to look at "The Eye of Jefferson," the exhibition at the National Gallery, (see June SMITHSONIAN). This was obviously *her* choice of what she could see and yet remain safeguarded. I can't imagine that Elizabeth was most fascinated with "The Federal City" and

Chief Justice Burger is to the left of the Queen, and beside him Vice President Rockefeller.

The Queen visits the Smithsonian castle crypt where the remains of James Smithson lie.

its models of how Washington looked in 1900 and other years. Her empire never even bothered to take over the city back in 1814 after capturing it and burning the White House. But Jefferson's taste—that may be of special interest to the same Royal Family from which Jefferson led his countrymen in the Declaration of Independence. "The Eye of Jefferson," however, is a huge exhibit—far too extensive for the Queen to absorb in her allotted time. She would have seen more as an ordinary tourist.

The Queen did her bit with all the savoir-faire we have come to expect of her—the incredible coolness, the ability to hurry from one place to another without, er, perspiring, the gracious little speeches delivered in those precise accents that sound so disturbingly like Carol Burnett imitating Queen Elizabeth. She left me, for one, an unregenerate Anglophile and an unrepentant royalist.

The Duke of Northumberland, aside from paying his respects to his more-or-less relative, James Smithson, gave us, on extended loan, a famous Gilbert Stuart portrait of the Indian chief Joseph Brant, an educated warrior who fought for the Crown during the Revolution and proved himself a formidable foe. The painting now hangs at the National Portrait Gallery.

Earlier this summer, I had done some rubbernecking at Juan Carlos, King of Spain. He and Queen Sophia pulled up at the Museum of History and Technology, were met by Mr. Ripley and Museum Director Brooke Hindle and were led inside to look at the new exhibit of Columbus memorabilia—some fascinating maps, gold from the New World, armor, chests and other items, also on loan to the Smithsonian. They were then shown the "We the People" exhibit and had a look at the First Ladies' gowns.

Carlos is youthful, handsome, upright, charming—very much your average, everyday king. His wife is a youthful, pretty, charming blonde, originally the Princess Sophia of Greece. But what struck me most about Juan Carlos was the ring of his title. As I was standing outside the museum, rubbernecking, a cute stenographer from the Department of Commerce hurried to join the crowd.

"What's going on?" she asked excitedly. "Who is it?"

I turned around to tell her it was the King of Spain, but the words came out as though I were standing beside a medieval trumpeter, making an announcement to the court: "The King of Spain!" I proclaimed, letting the words roll forth like thunder.

She looked at me round-eyed with awe.

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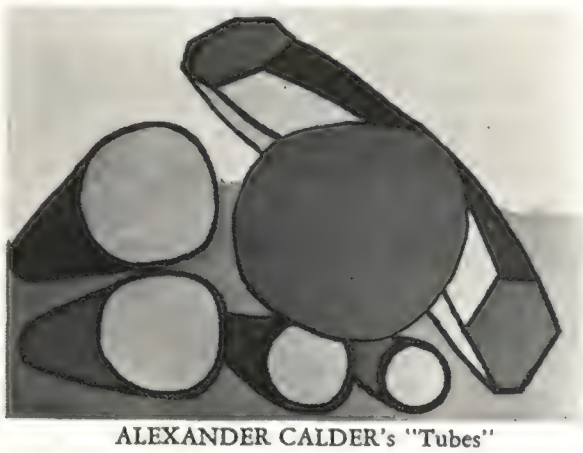

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Duke of Northumberland with portrait he is lending to the Institution.

"The King of Spain," she repeated eagerly. "Wow!"

I wonder why those four words are impossible to utter without an effect like the crash of cymbals. Elizabeth II is really closer and more important to us royalty-happy Americans, yet her title is unwieldly, even relatively unknown. You can't call her the "Queen of England" because she's more than that, and you can no longer get in that nice bit about her being "Empress of India (pronounced 'Injah')," so you're left with the awkward combination of Great Britain and Northern Ireland.

No, none of our present monarchs can touch Juan Carlos for the resonance of his title. The King of Spain. Whoo, boy!

Queen Margrethe II of Denmark came by last spring, and I got only a brief glimpse of her as I rubbernecked at great personal hazard from a window in my tower. She is delightful and, being Danish, she's a nut about design. She officially opened the Christian Gullager exhibition at the National Portrait Gallery and Director Marvin Sadik was made a Knight of Dannebrog. She didn't actually whack him on the shoulder with a sword, but an award arrived which proclaimed the title with a small peal of thunder all its own: "Knight of Dannebrog!"

Her fellow Scandinavian, King Carl XVI Gustaf of Sweden, came to look at the National Air and Space Museum, long before it was open, and was given a guided tour. He saw everything there was to see at the time—including workmen putting it all together.

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Charleston's heritage is not set aside neatly in museums (although there are plenty of them).

Charlestonians *live* their history, for this is a preserved city, not a restored one.

And Charlestonians are generous with their history. Wrought iron gates leading to ravishing gardens are left open. Inviting you to wander inside.

America's first major land and sea victory in the Revolutionary War was won in Charleston in 1776, when the city was already over 100 years old! Then in 1861, the first shot of the Civil War was fired on Fort Sumter in Charleston Harbor.

There's a wonderfully unhurried atmosphere to the city. Charlestonians say, "We urge people to take their time." After all, it takes time to re-live over 300 years of history.

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At Middleton Place, which also has a charming house museum. And plantation stableyards, where blacksmithing, candlemaking and other crafts are conducted with 18th and 19th century materials and techniques.

And in Charleston you not only watch what happens, you participate and learn.

Like on The Yorktown, the aircraft carrier which now has made Charleston its permanent home. Kids love scrambling aboard and visiting its living quarters, captain's bridge and flight deck.

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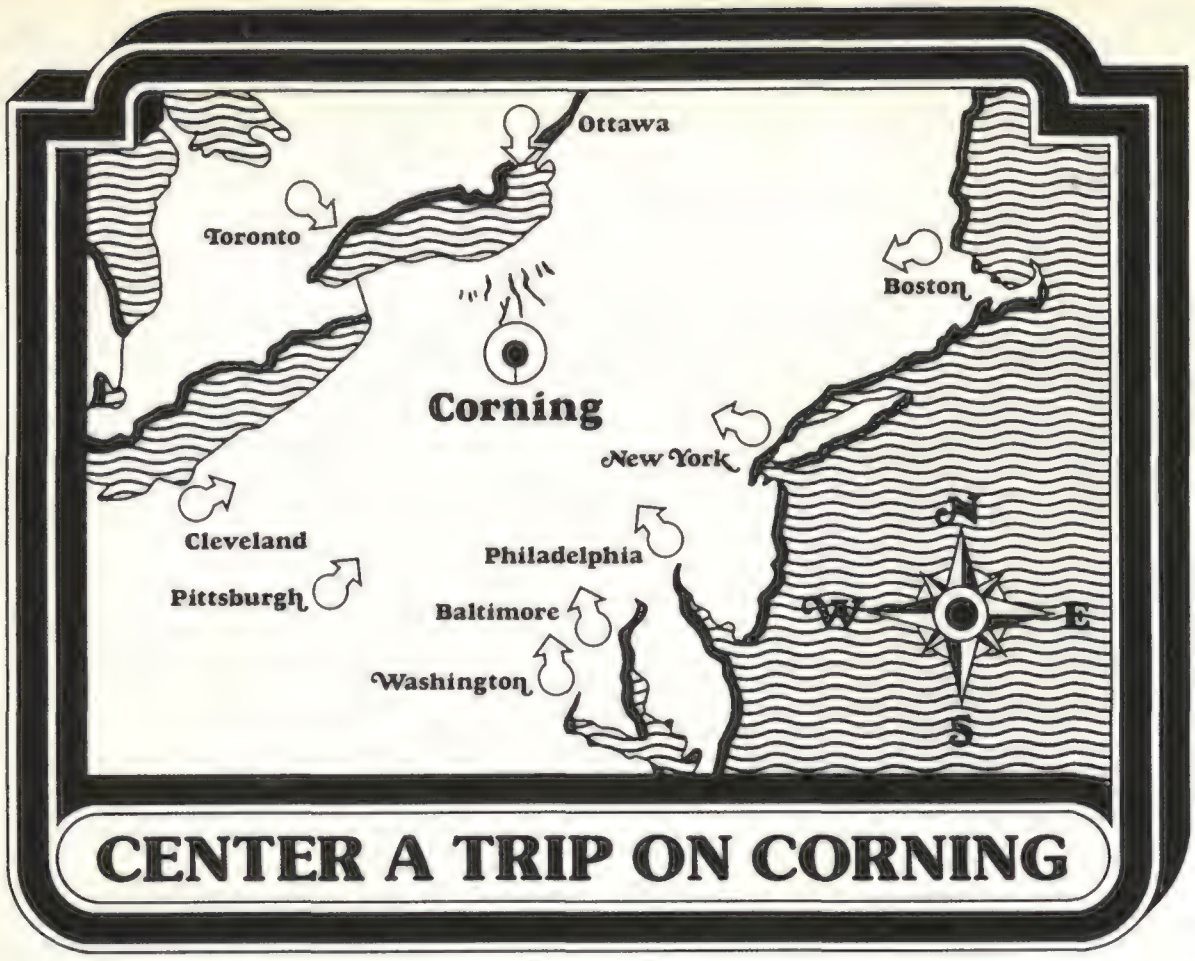

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We've also played host to Helmut Schmidt, Chancellor of the Federal Republic of Germany, who dedicated our planetarium instrument, the gift of his country. His wife is a horticulturist, and so was given a preview of the Victorian Garden outside the castle. She also toured "1876" and the Hirshhorn Sculpture Garden. More recently, Mrs. Malcolm Fraser, wife of the Australian Prime Minister, dropped by for a look at the Leonardo exhibition.

Betty Ford once again proved herself one of the world's nicest *un*crowned heads when she brought one of her gowns to the First Ladies exhibit in the Museum of History and Technology. She, as usual, came across as smart, unpretentious, honest and warm, and she collected almost as large a crowd of admirers as Muhammad Ali, last spring.

Betty's husband, also a notable, put in an appearance to open the Air and Space Museum. Being an American, not a visiting head of state, the President was allowed to act a little more like a tourist during his quick run-through of the building before the opening ceremony. He stayed longer in the Sea-Air Operations Gallery than he was supposed to, since he served in the Navy in World War II. He also wandered into the World War I Gallery, which was not on his schedule. He kept stopping to stare at something so that his whole cortege of secret service men, Smithsonian officials, newspapermen and TV cameramen would suddenly stop, too, bumping into each other like freight cars in a shunting yard. "What plane is *that*?" he would abruptly ask Director Michael Collins, and that seemed a nice touch. There he was, President of the United States, asking the same question that some 50,000 tourists a day would soon be asking. Democracy at work.

One thing the President didn't see at the Air and Space Museum was the film "To Fly." It is an extraordinary experience that leaves you limp, almost shattered by its intensity of impressions. Not that it has any particular story. It's just an outline of the development of transportation from ballooning days in the relatively unsettled Eastern states to jet transports over Hawaii. But Producer Francis Thompson and Director Byron McKinney are able to play with your sensations because of the size of the film and screen

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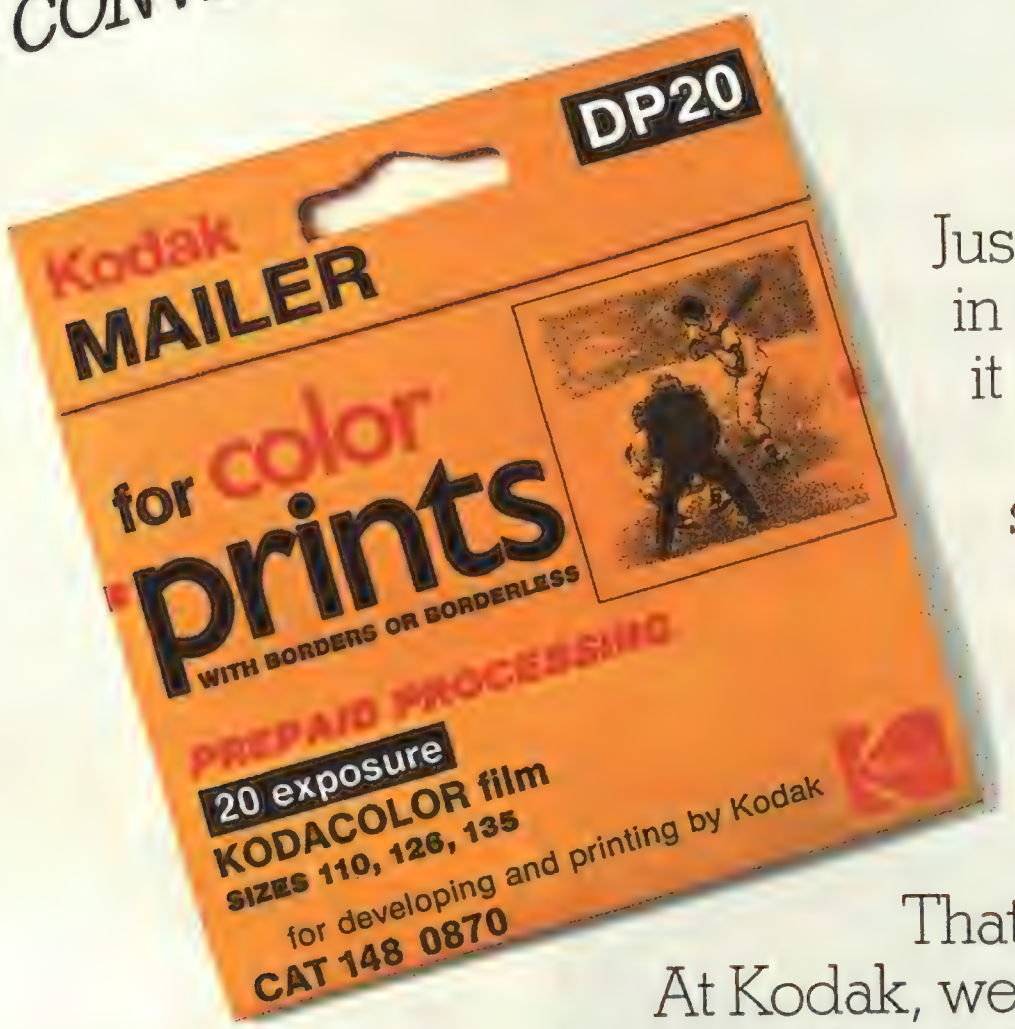

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After the first almost shocking impact of sensing flight this way, you suddenly find that it is not the horizon that is slanting and turning before your stable seat, but it is you—the whole theater. "Mummy," asked one youngster behind me as the film took us past canyon walls and between towering monoliths of the Southwest, "are we really flying?"

A good question. Yes, Virginia, you bet you are.

I have just seen the preview of another film about 1876 which was made by our own Smithsonian film group in conjunction with the production of our 1876 exhibit. I got to see it because I was in it—just barely. Looking carefully, I was able to see myself flicker past, faster than an Alfred Hitchcock appearance in one of his thrillers.

The point is that this Smithsonian film, put together on a grant from the National Science Foundation, directed by Karen Loveland of our film unit, written by our own Ben Lawless, filmed by our own John Hiller, edited by Milton Sink and acted by a cast of at least scores of Smithsonian people, is a delight to watch and participating was an enormous joy. Museum directors and porters, scientists and clerks, curators and cleaning ladies volunteered to take part and did so with gusto and even grace. "All Smithsonian people have secret yens for other times and places," Ben Lawless suggested to me. "So they wore those costumes as though born to them, and they acted 1876 as though they knew no other year."

Above all, they had fun. For a while, this Institution became a prep school. By the time this appears in print, "1876" will be open to the public at locations as yet uncertain.

Yet it is really an Institution, and to prove it the Office of Smithsonian Symposia and Seminars is getting ready for an international conference at the end of this month. Its title is "The United States in the World," and the idea is that foreign experts in various fields will discuss with American experts the influences upon the world of 200 years of American culture.

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"For once," Wilton S. Dillon, Director of Symposia and Seminars, told me, "the American participants are going to keep quiet and listen to what the foreign participants have to say about us."

The old American urge for being examined was satisfied in the last century by Alexis de Tocqueville (SMITHSONIAN, November 1972), who generally liked what he saw, Anthony Trollope, who generally didn't (at least, his *mother* certainly didn't) and Charles Dickens who blew hot and cold and hot again.

But now we are 200, and we have had a lot more impact on the world of culture, especially since World War II, than before. So our foreign visitors will read summaries of the papers they will have written about us. And we will bite our lips and listen and discuss and perhaps teach *them* a little, too.

Some interesting people are signed up, as of this writing—the President of Volvo, in Sweden; Sir Huw Wheldon of the BBC, who brought us "The Forsyte Saga"; the Iranian Minister of Science and Higher Education.

The conference opens the 27th at the Kennedy Center and runs through October 1.

EDWARDS PARK

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By Timothy Ehlen

How it felt to sail back into history aboard one of the Tall Ships

On route of Columbus, 400 young Spaniards and the author brought a huge sailing vessel to the New World, despite losing a mast

At Bermuda anchor awaiting orders to sail (from left): Chile's *Esmeralda,* Argentina's *Libertad* and Colombia's *Gloria. Juan Sebastian* is at far right, beside Norway's *Christian Radich.*

We set our sails and headed west, from the same islands and with the same northeast trade winds that Columbus had used on his voyages of discovery to the New World nearly 500 years earlier. The Spanish were again on their way to America. *Juan Sebastian de Elcano,* along with an armada of square-riggers (built as merchantmen but now training vessels for the mariners of the world), was off as a participant in Operation Sail 1976 to attend the biggest birthday party ever, in my own 200-year-old country, six weeks away.

I had joined the four-masted topsail schooner of the Spanish navy at Tenerife in the Canaries for the Tall Ships race across the Atlantic. I thought her magnificent—white hull, green waterline, four masts—all standing 52 meters (170 feet) above the water, the hull stretching 113 meters (370 feet) from the lantern on the stern that lights the red and gold Spanish flag, to the only woman among nearly 400 men: the figurehead beneath the bowsprit. *Juan Sebastian* is the training ship for future officers of the Spanish Navy. In her 49 years she has become a legend, circumnavigating the world more than once. The ship takes her name from the member of Magellan's expedition who took over the first voyage around the world after Magellan died in the Philippines.

We left the Canary Islands calm and were on our way through 2,500 miles of cobalt sea and puffy trade wind clouds. Away from land, *Juan Sebastian* settled down to life at sea. White uniforms were traded in for the practical gray and blue worn for deck work. Watches began their rotation, the ship's bell ringing out the hours. Land smells were left behind and we sniffed the clear air of the ocean.

I had come aboard as a total stranger to ship and crew, uncertain and wary myself, treated with coolness and suspicion, language a tall barrier (high school Spanish isn't much use on a topsail yardarm). I realized that the best way to get along was to take on

Photographs by George Silk, Timothy Ehlen and Charles Rotkin

With everything set, *Juan Sebastian* shows off the four square sails on her *trinquete* (foremast).

some responsibilities. I joined the *guardiamarinas* (midshipmen) in their workouts and lent a hand on the lines. This seemed to help matters. Later, a moment came that changed that feeling of mutual suspicion to one of respect and even affection.

Life aboard one of today's remaining great sailing vessels is probably not too different from what it was years ago. Sailors tend to be a conservative lot; they need a good reason to change anything. Certainly the Spanish have a great regard for the past. *Juan Sebastian* retains many aspects of seafaring the old way, yet the great vessel and her Spanish crew held a few surprises for me.

With the bong-bong, bong-bong, bong-bong, bong-bong of 8 A.M., the new watch takes over for the old. On the bridge the new officer of the watch repeats the ship's course and speed as given to him by the retiring officer. Navigators pass on information and salute a *buenos días* when finished. Deck crews line up for inspection by the *guardiamarinas* before dismissal. Another day at sea has begun.

Below decks, those that have had four or eight hours of sleep are now just getting up. Tables are set with hot coffee and bread. Before the first class of the day begins, there will be a short mass in the chapel for anyone who wants to attend. Because my quarters are in sickbay, right next to the chapel, on the mornings that I sleep in I hear mass whether I want to or not. I guess I hear more services than any other crew member except the chaplain himself.

The main function of this ship is the training of 63 third-year students from Spain's Naval Academy. They attend classes both in the morning and afternoon; they exercise; they get out on the deck three times a day to shoot the sun and stars with sextants. The whole routine of the ship revolves around these future officers.

Midday brings a flurry of activity on the afterdecks as the men line up for exercise. "Jumping jacks" get out of sync on the rolling deck, often landing in a different spot from where they took off. But there is nothing like looking out over a clear horizon while doing situps.

After the workout there is a saltwater shower and a chance to go to the "beach" (the afterdeck) and catch a tan.

When the heat of the afternoon settles in and the air looks white, the pace slows. Work is called off, except for classes. The foredeck is littered with nappers, radios playing at their sides. Officers deal cards in the wardroom. The watch checks again on wind (there is

Free-lancer Tim Ehlen, 24, had sailed only on Great Lakes near his native Detroit until shipping out on this adventure. He now seeks another saltwater berth.

none) and speed (perhaps half a knot). In the late afternoon work resumes as the ship lolls placidly along toward the sunset.

At seven promptly, a centuries-old tradition is observed on the main deck. Lines of *guardiamarinas* and sailors sway to the gentle roll as they sing the *oración*:

Tu que dispones de viento y mar,
Haces la calma, la tempestad;
Ten de nostros Señor piedad,
Piedad, Señor; Señor, piedad.

(You who command the wind and sea,
You make the calm, the tempest;
Have mercy on us O Lord,
Mercy, Lord; Lord, mercy.)

Like Columbus, these sailors, safeguarded by electronics and instant communications, recognize their Maker as maker also of the calm and the tempest and entreat His mercy.

Ship is "he" to Spaniards

Unlike our own sailors, Spaniards consider their vessels masculine. They think of the ocean itself as more important than the ship—and to them the sea is feminine. It was strange to me to hear *Juan Sebastian* spoken of as "he," but I found it somehow fitting to hear these men who know and love the ocean call it *la mar*.

On the bridge, salutes are exchanged with a *buenas noches* as the last light fades. Orders for the following day are read to the assembled men. When all is finished, and the *Comandante* has made any final remarks, the lines are broken with a sparkling piece of music and the day is officially over.

Juan Sebastian carries a full orchestra—20 musicians who play anything from classical Spanish airs to *Soul Train*. Music soothes the nerves of so many men crammed in such a small place for so many days on end. We have a nightly concert while *con la mar*, and, in port, the flag is raised to the national anthems of Spain and the country in which we are anchored.

Evenings aboard are cool and serene. The ship settles down for the night. Lights glow from cabin portholes, cigarettes spark in the breeze. Next day's food is brought out of the freezer to thaw. Bread is baked, too—nearly 700 loaves of *pan* put together by three bakers. The smell sweetens the midnight air. Many a night, I hit my sack clutching a warm loaf of bread, fresh from the oven.

Routine can be broken at any time with a call to *maniobra general* (general quarters) to tack the great ship—changing course so the wind strikes the other

Cofa (crow's nest) of foremast is sailor's heaven—130 feet from water, 30 feet below the top.

Spanish sailors inch out on a yardarm to rescue Benito, injured when foremast was snapped.

side of the sails. Because my quarters are with the *guardiamarinas,* they are more than happy to invite me along, even at three in the morning.

It all begins with a cornet call. The knock comes at the door and I know what they want.

"Now?" I ask, unbelieving.

"Sí, sí, ahora."

"Can't it wait until after breakfast?"

No way. Gym shorts, tennis shoes and a shirt, and I am up the companionway with the rest of them. It looks like a New York subway exit at rush hour. A minute before I was sleeping warmly; now I am scrambling up the ratlines of the foremast in the middle of a moonlit night.

Hand over hand, feet riding the inside of the cable to the next step, five of us rise 130 feet above the water to the crow's nest where we will work the two topsails. It may be dark, but I know my knuckles are white. Somewhere below on the deck, 150 men are standing to their lines, waiting for orders to be piped to them by the *pito,* or whistle, in the mouth of each petty officer stationed at each mast. All commands for pull, stop, let slack out, are given by these *pitos.* Six officers blow the orders, and the men listen to all, but obey only their own. We are ready, and the bridge orders the beginning of the show.

First to come about are the four square sails on the *trinquete,* or foremast, where I am perched. Clacking blocks announce their movement in the dark as they are brought athwartship—perpendicular to the ship's course. At the same time, in the platforms of the three fore-and-aft-rigged masts, the men are bringing in staysails and *escandalosas* (topsails), hopping over the stays so the sails can be reset on the other side.

The big gaff-rigged sails come next. *Pitos* scream below, ropes squeak and men keep time shouting *"aaahora, aaahora, aaahora."* Tons of steel and Dacron swing to midships. Carried by the ship's momentum, we begin to move over to the new tack. Booms swing over and sails take form with the wind. The *trinquete's* four sails—*juanete, velacho alto, velacho bajo* and *trinquete* (the same name as the mast) squeak over to

Juan's broken mast was lowered by muscle and rehoisted the same way, with cries of *"ahora! ahora!"*

Bowsprit netting, shredded by collision, is mended as figurehead watches. Its left breast was hurt.

port and glimmer in the moonlight. We used to call them topgallant, upper topsail, lower topsail and foresail or forecourse in our great days of square-rigged ships. Finally the topsails on the fore and aft masts are pulled into place and snap alive high above us all. It's over now, and we climb down the new windward side of the rigging, and head back to bed.

Total elapsed time from that first call to dismissal: eight minutes.

Race day. We have reached Bermuda and now will race the 16 other Tall Ships to Newport, Rhode Island. We parade out of Hamilton Harbour with the others and begin the two-hour journey through the coral reefs to the open sea. Our band on the stern deck is playing to the spectator boats and people on shore. It's good to be going out again. The men are allowed to leave their parade posts on the upper decks, and we all settle down for a nap before the midafternoon starting time.

Too soon the cornet sounds *maniobra general* and we break out to set the sails. This is a different sea now, filled with just as many spectator craft as there are whitecaps. Helicopters and small aircraft circle overhead, preparing to photograph the greatest spectacle in racing history, the thundering start of the world's only race of massed square-riggers. We are nearing the gray British frigate, H.M.S. *Eskimo*, that marks one end of the starting line. I scramble up the foremast with some other men, not to work, but to take a front-row seat for the best show in town. Wind is a good 20 knots from astern and the 16 square-riggers are crowding toward the line like a fleet of day sailers. Our engines are in neutral. The call comes from the bridge to hoist sails. Wrist-thick lines go taut, snap with the strain. *Pitos* scream below and I hear, far down, the murmured *"Ahora, ahora, ahora"* of the deck crews in between. The square sails are set. We are flying.

I climb higher and shout with excitement. It is absolutely beautiful below with all these ships under full or part sail in such close quarters. *Christian Radich, Sagres* and *Juan Sebastian* are all in a row

coming down to the line. There is a flash and boom from the frigate: five minutes to go.

But things are getting too close. The 15-year-old Norwegians of *Christian Radich* handle her like old salts as they clew up sails to prevent crashing into Argentina's green-sailed *Libertad.* Now *Libertad* is across the bow of the Portuguese *Sagres,* just off our starboard beam, and I watch in concern as *Sagres'* bowsprit passes over the stern of *Libertad,* barely clearing. We are next in line, and I realize with horror that we will surely strike.

"Down, everyone down!" comes the command from the bridge. Yet some of us stay aloft, stunned by the prospect of a collision of two graceful beauties. The bridge orders engines full astern. We are almost dead in the water. *Libertad* holds her course.

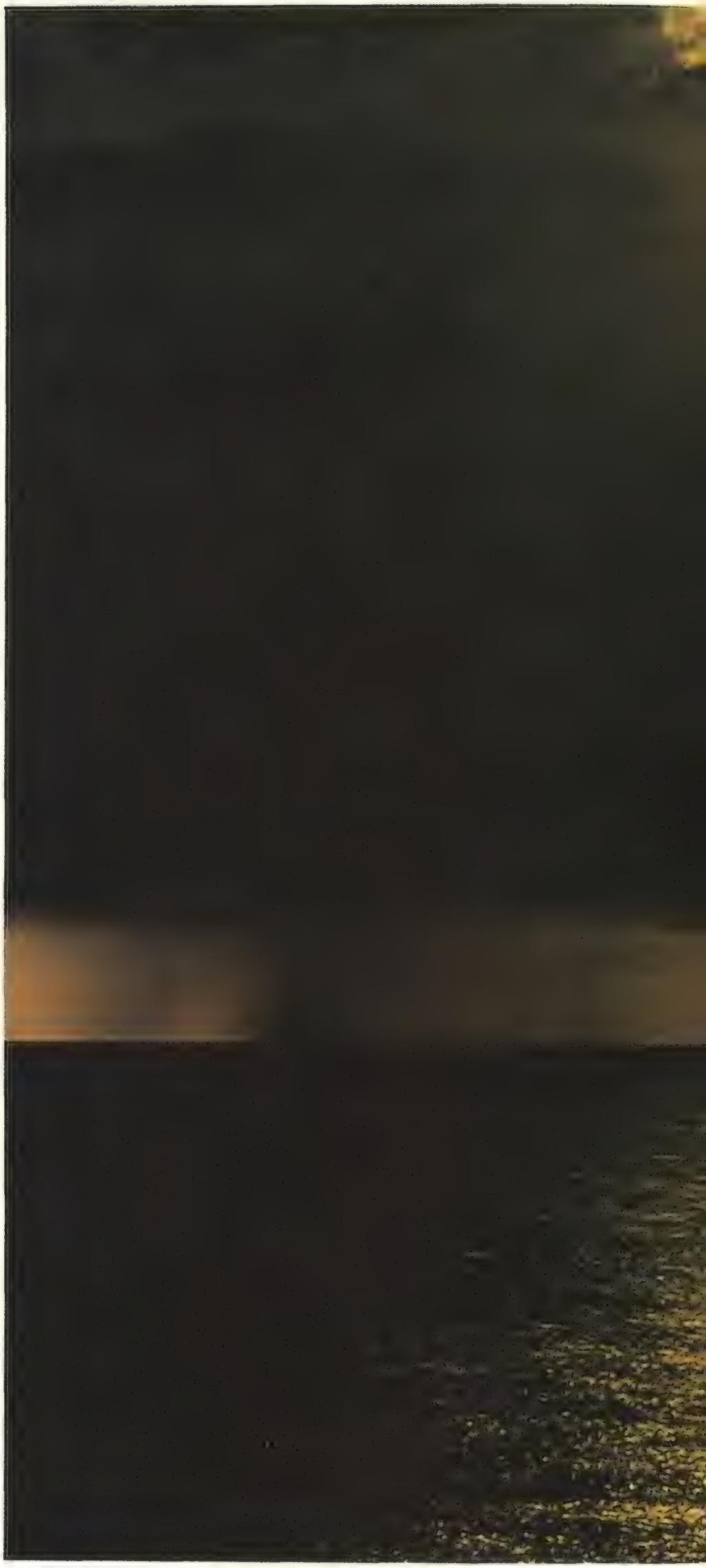
I am clipped to the ratlines by my safety harness and I steady for the shock. I never really feel it. Our bowsprit passes over *Libertad's* gunwale, snapping apart like a twig. The white caps of the men on *Libertad* move away from the broken spar as it rips into their mainsail. Curses fly back and forth on the main decks, less than a meter apart. There is an explosion on the water as an orange life raft is broken loose from its lashing aboard *Libertad,* falls overboard and inflates. Is there a man overboard too, we wonder. But no head rises beside the raft.

Down comes the trinquete

Fumbling for my safety clip, I release myself and head down to the crow's nest, 30 feet down the *trinquete.* Damned if I'm going to die up here. The platform is empty on one side; all the men who have not made it down are packed on the windward side and there are calls of *"Tranquilo! Tranquilo!"* ("Take it easy!") The mast shakes wildly. *Libertad* has fouled and snapped our first two headstays and without their support, the *trinquete* must go by the board. Habit alone is not enough to hold up a mast.

A tremendous groan of tortured steel. The upper section of the mast is pulled down, bending double over our heads, putting us in the shade. Rigging tumbles all around. Loose sails flap and pound. My heart is in my throat as I hang on.

The officer of the foredeck is the first man up the mast while everything is still falling. He asks if we are all right, and then we hear the scream of an injured man above our heads. The officer takes my harness and climbs out on what a minute ago was 30 feet of soaring mast. Three *guardiamarinas* follow to help save Benito. I cannot stay behind. We find him suspended in a sail. We pull him free and place him on a spar until a stretcher can be hoisted up. The race has passed us by, and *Libertad* is sailing off with the



A Gulf Stream squall (left) interrupts sunrise serenity as United States *Eagle* sails near Bermuda.

rest of the fleet. According to racing rules, we had the right of way at that start. But now who cares? (*Libertad* was later disqualified).

Back on deck, we stand quiet and stunned. What started out to be one of the most glorious moments in sailing history has turned into disaster for us. Yet something has happened to me. When I descend to the deck, men come up to me, as they do to the others of us who were aloft there, and say "You were born again, today!" They clap me on the shoulder. And I know that this is now *my* ship.

For three days and nights, back at the U.S. Naval Annex in Bermuda, we worked on the bow and mast section. Bowsprit netting had been torn away, arm-thick steel bent and broken. Above, the heavy steel mast looked like a broken straw. It was cut away and lowered to the deck to be repaired in Newport. The welder's arc sparkled high overhead through the nights until we sailed three days later, steaming to Newport to finish repairs and get ready for the parade of Tall Ships in New York Harbor, July 4. We know that Benito will be all right, despite seven broken ribs, three crushed vertebrae, a collapsed lung and a damaged kidney.

On our first day out we passed the last of the racing ships, all sitting on lake-calm water waiting for wind. The radio crackled with messages of good wishes and glad-to-see-you's. The trip was also marked by a well-deserved party, the celebration of the feast of San Juan. After mass on the main deck, the crew broke out in costumes and skits, and a batch of sangría appeared for all hands off watch. In Spain, this is a national holiday, for the King's first name is Juan. The 50-odd Juans aboard received special note. The celebration could not have come at a better time, after catastrophe, near tragedy and exhausting preparation for the parade.

From *cofa* of *Juan*'s mizzenmast (*mesana*), antlike midshipmen on afterdeck gather around an instructor.

In Newport, the mast was reworked, everything was painted white again. And while it was grime and sweat on the bow, it was crisp white uniforms and salutes on the stern as admirals and ambassadors came aboard. On the evening before we were to leave for New York our mast was fitted, straight and strong. We cheered, and so let the whole shipyard know that *Juan Sebastian de Elcano* of Spain once more was alive and well.

Out to sea again for the last time with this, my ship. I climb back to the scene of the accident. It is beautiful, as always, but there seem to be new creaks and groans up there that I have never heard before. Probably just me. We steam for two days and nights and head for Sandy Hook just below New York. Painting and polishing continue as we drop anchor in the middle of the fleet. The scene takes the outer harbor back a hundred years, the Tall Ships swinging at anchor, a quiet prelude to the excitement of the next day.

Dawn of the Fourth of July is smoggy, but pleasant, the sun large upon the water. The towers of the Verrazano-Narrows Bridge poke above the haze to outline our entrance to the inner harbor. Men in dress whites polish the last of the metal. On the foredeck, the third commander shakes my hand and, as representative of an ancient land, congratulates me on my country's magnificent achievement in surviving a mere two centuries.

We glide into the harbor and the spectacle spreads before us: the gray warships of the International Naval Review, the aircraft carrier *Forrestal* bearing President Ford, the shores layered with people. Our officers, *guardiamarinas* and sailors are in full dress uniform, at attention at their sail stations. Passing *Forrestal,* the command is given for the sailors to go up the rigging in parade fashion and stand on the yardarms.

I look at that foremast: *juanete, velacho alto, velacho bajo, trinquete.* Only two weeks ago this was a shambles; now here stand Spain's finest. Abeam of *Forrestal,* the cornet comes over the loudspeaker and 400 men salute.

Farther up the Hudson we set sails (for looks only) and continue past George Washington Bridge. On the return run, passing the bridge, we notice a tiny ship with a strange configuration. It is small and dark, white sails with a red cross. I am told that it is a replica of Columbus' flagship, *Santa Maria,* and the figure in white saluting us from that high poop deck is Christopher Columbus XVIII, a direct descendant of the Admiral of the Ocean Sea. Four years ago young Christopher was a *guardiamarina* on *Juan Sebastian.* Now he's a Lieutenant j.g.

Applause from a thunderstorm

Sails are furled, and we head for Pier 90. A squall up ahead applauds with thunder. What began so many weeks ago is now almost over. We have a party on the final evening: dancing, hundreds of invited guests swarming upon the decks, all masts and spars floodlit. Out underneath our bowsprit the *Santa Maria* bobs, reminding us that, in a sense, her original version made the whole of Op Sail possible.

All signal flags are down by eight next morning. Men are wearing sunglasses to hide the red eyes of too little sleep and too much drink. I should have mine on too. I have spent my last night in a bunk that was a foot too short and way too soft. For me it has been the last night and the last day for so many things.

A few of us talk and exchange addresses. "Well, *amigo,* it is too bad you are not coming with us." They kid me that I will need a handkerchief at the pier.

They were right. A few of them did, too.

In New York, the morning of the Big Birthday was typically hazy. Flotillas of small spectator boats appeared ghostlike from every inlet of the harbor and converged on the misty outlines of the Verrazano-Narrows Bridge. And beyond, in lower New York Bay, you could begin to see huge, strange shapes—towering masts rising from powerful hulls with long, tilted bowsprits. You looked at them incredulously because you had never seen such ships before, yet you had a sense of *déjà vu.*

The parade of ships began as the tide went slack and began to help them through the Narrows, just as, more than a century ago, it had helped *Flying Cloud, Great Republic,* the other clippers that were the bursting pride of our country. The Coast Guard's bark *Eagle* led the way, as a host should. As she passed under the bridge, her yardarms manned by her crew, every cadet standing straight, legs spread on the foot ropes under the broad spars, the band playing as she neared the *Forrestal* with the President aboard, *then* you began to feel like the Fourth of July.

New York is a tough and cynical city, not apt to get sentimental about a Bicentennial of tangled plans, broken promises, forgotten dreams. But when the Tall Ships swept through the harbor after *Eagle,* each with her yards manned, her port-of-call flag snapping in the rigging, red, white and blue, her men suddenly roaring out three cheers—for *us* Americans, by God—throats lumped and eyes swam and even blasé taxi drivers called out "Happy birthday!"

Italy's training ship *Amerigo Vespucci* contrasts with smaller barkentine in parade on Hudson.

Norway's *Christian Radich* becomes a powerful wind machine as 15-year-olds man the yards.

By Benjamin Forgey

Two centuries of U.S. sculpture all in one place

The Whitney shows a comprehensive survey of life and art—from the aboriginal to the suppositional—as seen in three dimensions

It is difficult to say when American sculpture was born. When William Rush of Philadelphia carved, in 1808, his large figures of *Comedy* and *Tragedy* (p. 54) for the niches of Benjamin Latrobe's New Theatre on Chestnut Street, he did so with the self-evident ambition to make an impressive public statement. He utilized all of his formidable skills as a woodcarver to make those huge blocks of pine, painted to look like stone, resemble something more noble, more universal and, yes, more *European* than any American statues the citizens of the young country had yet seen upon their own streets and squares.

But Rush was 52 when he carved those bigger-than-life figures. He already had behind him a long, successful career as a carver of "functional" objects. His specialty was sculpting figureheads for the American sailing ships that traveled the world, and it is interesting to speculate that one or two of Rush's own works in this line might have been seen by a contemporaneous Tlingit carver along the Northwest Coast.

If so, there was, of course, no observable influence. But the very fact that Rush and his confreres in the cities along the East Coast even inhabited the same continent as the masterful anonymous carvers of the Northwest Coast gives pause to any conventional ideas about the origins and nature of "American" sculpture.

That is perhaps the main lesson of the great gathering of sculpture (on view through September 26) organized by the Whitney Museum of American Art in New York as its contribution to the incredible outpouring of energy and scholarship we are witnessing in our museums during this Bicentennial year. There has not been anything like the Whitney show before.

"200 Years of American Sculpture," a huge under-

Art critic Benjamin Forgey last wrote on art and technology in the March issue of SMITHSONIAN.

American folk art produced many masterworks in the 19th century highly admired in the 20th, including *Thin Indian Chief* (c. 1850, at left);

Tinsmith (c. 1895) facing the extraordinary *Father Time* (c. 1900). At rear is *Seated Indian* (c. 1860) back-to-back with *Ship Chandler's Sign* (c. 1850); *The Baseball Player* (c. 1888); and (right foreground), *Harry Howard, Chief Engineer of the New York Volunteer Fire Department.*

taking even by the inflated standards of this particular year, is the first comprehensive survey of its subject, the first assembling in one place of an enormously heterogeneous body of three-dimensional work whose chief shared distinction is that it was produced, on this continent or elsewhere, in response to the variety of opportunities presented by American culture.

It is odd that this hasn't been done before, but for some reason sculpture has taken a back seat to painting in both popular and scholarly imaginations. Even during the decades when interest in the history of American visual arts was at an all-time low, there was some general awareness that in the 19th century American artists created a national school of painting.

Photographs by Yale Joel and the Whitney Museum of American Art

Philadelphia Museum of Art

William Rush's *Tragedy,* one of a pair, of course, with *Comedy,* done for Latrobe's Philadelphia theater.

In Boston, for instance, there was always maintained some pride in the forthright "American" quality of Copley's American portraits, as opposed to his more stylish efforts once he moved to England. Audubon's bird paintings never lost their appeal as an important part of the national heritage. The distinctly American notes sounded in the genre paintings of William Sidney Mount or George Caleb Bingham, and the even more popular prints published by Currier & Ives, were not forgotten. Most importantly, the landscapes of the Hudson River painters and their followers firmly established the idea that there existed a distinctly American visual culture.

It is hardly surprising, therefore, that when attention began to be paid to the history of visual arts in this country, it concentrated heavily on painting. This emphasis was fed by the realization, sometimes resentful, that when in New York in the 1940s and 1950s the United States finally did produce a volume of work making an undeniable claim to international attention, it was the painters who did it.

However, given the general reawakening of historical consciousness about American art, it was but a matter of time until the scholars, the museum professionals, the art dealers and the collectors began to focus on sculpture. Again, perhaps, the tendencies of avant-garde artists had an effect, for in the past 15 years or so there has been a marked shift of attention in the direction of three-dimensional work. In any case, that time has now arrived and the Whitney Museum, greatly to its credit, has seized upon it.

In art, as in so many areas of life, the arrival of European settlers in North America turned into a hardly mitigated disaster for the Indian tribes, many of which had extensive carving traditions that disappeared quite rapidly after contact. But the tribal sculpture that does survive from the past 200 years set standards of subtlety and vigor that were rarely matched in the main line of American sculpture during the 19th century (see p. 84).

For obvious reasons, the more vital surviving tribal arts were found in outlying areas, distant from the European expansion. Traditional Eskimo sculpture, for instance, maintained its force throughout the 19th century and much of our own, as can be seen in the stunning shaman's mask (opposite). The Tlingit of the Pacific Northwest were a special exception in that Tlingit society was suited to take advantage of both the increased wealth and the new carving tools brought by trading agents, and used them to make ever more ambitious, elaborate totem poles, house posts, chests, bowls and all sorts of day-to-day artifacts. The incised geometric, anthropomorphic designs of the Tlingit, often brilliantly polychromed and inlaid with shining bones, teeth or shells, are a high point of any survey of 19th-century sculpture on this continent.

In fact, it was only when the academic tradition had worn thin in this country and in Europe that artists began wide-ranging searches backward in time and space for fresh inspiration, and only after this occurred were Westerners prepared to appreciate the esthetic and social sophistication of the "primitive" cultures of this and other continents. A similar discovery of the straightforward vitality of indigenous folk art was also a part of the early modernists' vigorous quest for sources untainted by association with the distrusted weight of the Western tradition.

Perhaps because so much of the conventional American sculpture of the period concerned itself with rep-

resenting the human form in various symbolic guises, human figures made for decisively non-art purposes by unselfconscious folk "artists" of the 19th century still make a big impression today. It is impossible not to be impressed by the sophisticated charm of a svelte frock-coated and top-hatted man used as a sign for a sheet-metal shop in Brooklyn (p. 52), quite apart from the important fact that he was made completely of unadorned sheets of tin—an "honest" and expressive use of material sought after by many a modernist sculptor. And then there is old Harry Howard, Chief Engineer of the New York Volunteer Fire Department (p. 53), whose declarative portrait was carved in wood in about 1860 for an honored place atop Firemen's Hall in lower Manhattan, an enviably uncomplicated solution to the problem of public sculpture.

Not all folk sculpture was so public, of course. James Hampton, who was employed nights as a janitor by the federal government in Washington, was an intensely private man who spent much of the last 14 years of his life (he died in 1964) in a rented garage constructing his *Throne of the Third Heaven of the Nations Millenium General Assembly,* a glittering roomful of pedestals and icons fashioned from ordinary materials and covered with gold and silver foil. Hampton's *Throne,* a true marvel of belief, speaks eloquently of the rich interior life that surrounds all persuasive art. The fact that he was by no means a professional artist explains much of his work's odd emotional power, but in some important ways makes no difference at all.

A desolate death cart

There are always regional accents to be found in the history of any art form in a territory as large as the United States. In sculpture, none is so pronounced as the devotional images, or *santos,* carved a century or more ago in New Mexico—for example, the striking *Death Cart* (above) carved by *santero* José Ines Herrera. This skeletal figure with its hideous grin, seated in a crude wagon and holding, instead of the traditional scythe, a small but lethal-looking bow and arrow, is nightmarish and surrealistic. Though such a desolate image is a completely apt expression of a desolate geography and a remote, haunted religious culture, it also speaks with unequivocal directness to an unhappy, though common, heritage of the 20th century.

In the years following independence, sculptors were no different from practitioners of the other arts, though sculpture did get off to a slower start because of its more stringent technical requirements. With their painter colleagues the sculptors participated in the national search for an appropriate set of subjects and a high style befitting the proud aspirations of the

The Denver Art Museum, Anne Evans Collection

Cottonwood root, horsehair, dog hair, pine and cloth are used in 19th-century New Mexican *Death Cart.*

Collection of James Economos

Rhythmically expressive Eskimo art is strongly exemplified in 19th-century mask from Lower Yukon.

A galleryful of David Smith's welded metal forms provides, in one visually punctuated place, the strength and grace of the artist who significantly helped to launch modern era of American sculpture.

Whitney Museum of American Art

An open, three-dimensional wire drawing in air is Alexander Calder's *The Brass Family,* created in 1929.

Collection of Mr. and Mrs. Richard L. Feigen

A little box, 10½ x 18 x 6 inches, by Joseph Cornell, opens large vistas of the fanciful and mysterious.

new republic, and like their colleagues they found both in Europe—particularly in the European revival of the classical styles of Rome and Greece. In sculpture, however, owing in part to its late start, the neoclassical revival took stronger hold and lasted longer, at least in the public commissions.

This produced some famous rows, for the time when the first group of American expatriate sculptors were setting up shop in Florence and Rome in the 1830s was a period of a rougher, more homespun type of politics and public sentiment than the years under the Virginia oligarchy. Jacksonian America did not take kindly to Horatio Greenough's colossal statue of George Washington (SMITHSONIAN, November 1973), half-clad in a toga and modeled after descriptions of the most famous statue of the ancient Western world, the *Zeus* of Phidias. Greenough, who worked on his statue intermittently for nine years, had tried to clothe the by-then almost mythical Founding Father in the heroic nobility of the Greek god, but he succeeded at the time only in angering his countrymen.

Rows of another sort became common as the century wore on, the most notable being the reception given to Hiram Powers' *The Greek Slave* (SMITHSONIAN, November 1972) when it first toured the United States in 1847. This poor, modest lass, clothed but in chains attached to her wrists, was a huge popular success. Upstanding Americans normally offended by even so chaste a show of public nudity—and the statue is safely to the nude side of Lord Clark's famous dichotomy of the naked and the nude as types in art history—apparently were appeased by the circumstance that it could easily be blamed on the Terrible Turks for, in the words of a contemporary broadside announcing her tour, "the subject is a Grecian Maiden, made captive by the Turks, and exposed for sale in the Bazaar of Constantinople."

The Greek Slave was the precursor of many a mid-century statue whose exquisite marble flesh was draped in sentiment. Remarkable examples are William Rinehart's triste *Hero* and her Michelangelesque lover, the sadly resolute *Leander.* The mythical story is that Leander drowned in the straits of the Hellespont swimming to a nightly assignation; Hero followed to join him, perhaps in another world.

The Whitney show comes with a fully illustrated catalog published by David Godine, the first comprehensive book on the subject since the Wayne Craven text of eight years ago, which was the first treatment of American sculpture as a whole in more than half a century. The book includes essays by seven different scholars, including Craven, and a 70-page section of artists' biographies that in itself provides a fascinating, condensed, crazy-quilt perspective on the entire subject of American sculpture.

One of the catalog's accomplishments is the perceptive essay by Daniel Robbins on the period between the 1890s and the 1930s, aptly titled "Statues to Sculpture." Robbins details the achievements of the gifted class of Beaux-Arts sculptors (Augustus Saint-Gaudens, Frederick MacMonnies, Daniel Chester French *et al.*) who dominated the field well into the

Des Moines Art Center, Coffin Fine Arts Trust Fund

1920s. Robbins cautions, however, that their ideas of sculpture and their stranglehold on commissions "retarded the history of our sculpture up to the Second World War." Again, he notes the curious time lag of sculpture. "For American sculptors," he observes, "the Armory Show passed with hardly a ripple of interest." Nonetheless, for a time such as ours so concerned with sifting again through the historical evidence to uncover the unjustly forgotten and ignored, this is the period that will be richest in modest rediscoveries.

However, it was in the Thirties that the foundations were being laid for much of America's greatest sculpture. It is an irony built into shows with a national bias that the more profound and authoritative art work in them eludes national classification. We can feel much that is American in the spirit of Alexander Calder's work (p. 57), for example, and such perceptions do indeed enrich our understanding of the work, but in the end they are not binding; his ingenious and often playful employment of openness and motion in sculpture, built upon the precedents of international modernism, transcends the particularities of geography. Similar observations can be made about the magical world that Joseph Cornell built into his tiny boxes (p. 57), Louise Nevelson's austerely impressive accretions of wooden things, Isamu Noguchi's elegant, mystifying abstractions, Richard Lippold's wire constructions and David Smith's powerful essays in welded forms (p. 56).

A conventional snobbery regarding American sculpture—that nothing worthwhile took place before David Smith—possesses a grain of truth, but it is a terrible snobbery and is exposed as such. The truth in the notion, however, is that the esthetic high points of American sculpture up to now have indeed occurred in the work of such 20th-century sculptors as Smith, Calder, Cornell and Nevelson. Everything modern in American sculpture before Calder does have a somewhat provisional status, though it does not lack for skill, conviction, intelligence, charm and countless other praiseworthy attributes. Everything after Smith is provisional, too, though in a different way, because it is in a sense unfinished, and too close to us.

Indeed, the dizzying pace of artistic change in the past 15 years has been more apparent in sculpture than in any other artistic form. Admittedly, the word sculpture must be used loosely to encompass the astounding variety of activities taking place. There has been no idea too esoteric (or on the other hand too obvious), no material too weighty (or too evanescent), no subject too ordinary, no technique too farfetched, no space too grand, not to have been given a serious whirl in the merry-go-round of the art market.

Even so, the picture that emerges, while confusing, is contrarily one of great vitality and open-endedness. If there has been a predominant trend, it is toward ever greater inclusiveness and environmental scale, most notable in structures built on remote sites and encompassed by the museum only in photographs. Even inside the museum, however, this idea is manifested in numerous ways, from the elegant, angled, translucent planes erected by Larry Bell, which are slightly and purposely disorienting to one's sense of place, to the walk-in mirror hallway constructed by Lucas Samaras, which is disorienting in a much less hospitable way.

The scene is too richly varied, however, to be categorized by a single "trend." There are artists who have extended the modernist idiom in lucid, exciting ways, such as Mark di Suvero, who created new spatial experiences from sources as diverse as the paintings of Franz Kline, the mobiles of Calder and the structural logic of the constructivists; and George Sugarman, who added bright color and amorphous curves to the constructivist lexicon, uniting logic and illogic, rationality and irrationality. And there is a whole range of individualists, especially apposite in this setting, who have made something new out of the figurative tradition—artists such as Edward Keinholz and George Segal, not to mention such boundary-crossers as Claes Oldenburg, who elevates the visual pun to, as Cezanne said, "an art of the museums."

It would be easy to conclude from the perspective of 200 years that sculpture as we knew it is dead, but if so, we must also acknowledge that it obviously is leading a rich afterlife.

This amusingly menacing object, 12 feet high, based on a small common device, is Claes Oldenburg's *Three Way Plug, Scale A (Soft), Prototype in Blue.*

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If it weren't real and entirely natural,
this picture of a loon, arrowing its
way across the blazing face of the sun,
might be a feverish theatrical backdrop.

By Charlton Ogburn

In fall's clear skies birds part the air and raise the spirit

To spend the whole of a day lying on one's back in the soft, green grass, looking up at birds in the air, is to be close to heaven

I fell in love with birds at the age of 11 and have never fallen out of it. I am an *ornithophile* rather than an ornithologist, though during most of my adolescence I hoped to become the latter. Had I done so I should probably not be setting forth as I am to try to account for a lifelong ardor. I should have known too much about birds and have stood overwhelmed by all that could be said about them, and doubtless I should have regarded the human response to birds as irrelevant and distorting. A title such as *The Adventure of Birds* would hardly have occurred to me and would have put me off if it had been suggested. What would it have meant? That birds are an adventure for life on Earth to have undertaken? That the pursuit of birds is an adventure for us? (It means both, really.)

Although in my youth I was often without other company than my own and that of birds, and felt consoled and elevated by the latter, I was at the same time coming to share in the general fascination and concern of my species with itself. Even the most devoted disciple of nature must attach a high importance to humankind if for no other reason than without it the object of his fealty would be denied understanding and remain uncelebrated.

However, if my love of birds has not been preemptive and I have had other preoccupations, it has been constant. It preceded and has not been displaced by the others. In half a century there has been scarcely a day when the sound of an unusual bird's voice would not have brought me up short; when the form of any bird, however barely glimpsed, would not have registered on my consciousness, demanding recognition of what it was and what doing. And in all those years I have had to be sorely pressed indeed not to be susceptible of delight and excitement from a fresh revelation of the charm of birds or of the drama of which they are so expressive. . . .

In the central Atlantic states, autumn, to choose a season at hand, begins in the middle of April. That is when dandelions and little early white mustards will have made their first seed—their versions of the ripe pumpkins and red apples of October. After another month almost all the other first spring flowers will have done likewise. As the days and weeks roll on, more and more plants will have passed through the springtime of flowering and matured their crop.

If there is autumn in spring, there is equally spring in autumn. Wild sunflowers and goldenrod light up whole fields early in September. Blue spires of pickerelweed blossoms rise from the tidal flats of our estuary, on which jewelweed blooms abundantly, the little pouting, orange trumpets evenly distributed on the shrub-sized but delicate plants of bluey foliage, looking misted.

If summer spans the three warmest months of the year and winter the three coldest, then autumn, intervening between the two, begins about September 5th. But here in northern Virginia the woods then are almost as green as ever. Only in the high mountains to the west, as a rule, has there been a frost.

Autumn began for us last year on August 18th when the dogwood berries were getting red: a young Blackburnian warbler appeared at the birdbath. Three days later it was back, or another like it, with a female Blackburnian, a female Canada and a Tennessee. (The little visitors are comical in their ablutionary impulses. They flit nervously to the water and bounce off as if scalded.) The 24th brought an extraordinary flurry. At one time a Blackburnian, a Canada, a hooded and a blue-winged warbler were all bathing in a row.

The Canada lingered longest, a beautiful male, suede gray above with necklace of black slash marks against a glowing yellow breast. Like the others, he could have no idea of what he was flying all the way to Peru or Ecuador to escape, may never have known a cold day. Or am I being parochial? Perhaps by his lights he was going back to where he belonged, in a South American rain forest, after a long and perilous excursion to raise his young in the comparative security (no threatening monkeys or lizards and few

The Adventure of Birds *by Charlton Ogburn, ornithophile, will be published this month by William Morrow & Co.* *© 1975 Charlton Ogburn.*

Migratory grackles sit like black bobbins on a snow-framed loom. Streaming in floods

snakes) he would find in the Canadian-zone woods.

There is, indeed, probably validity in the view that our wood warblers (orioles and tanagers), as is certainly the case with hummingbirds, are tropical species that come north to breed, taking advantage of the annual springtime opening up of the vast, underpopulated (or under-avianated) lands vacated by the snows—in human terms as if the settlement of the New World from Europe were a yearly occurrence. By contrast, our thrushes, sparrows, crows and jays, pipits and larks might be considered northerners that retreat southward before the rigors of winter.

However it may be, that this sunbeam mite of birdity, this Canada warbler, should twice yearly journey from one to another of two such mutually exotic homes 4,000 miles apart—*four thousand miles,* please—is to me utterly fantastic.

September 21st:

> Remarkable descent of warblers upon concrete birdbath in early afternoon of mild temperatures and brisk, southerly breeze. Two brightly colored parulas bathing at same time. Followed by a redstart in dull female plumage, then another. Also an immature blackpoll and a red-eyed vireo. Then three Tennessee warblers in fall plumage, quite greenish yellow. Two shortly afterward in earthenware bath on other side of house. Bathed vigorously, up to their mid-parts in water, for a good five minutes—quite extraordinary. One alone would surely never have remained so long. Charming to think of this companionship, conceivably throughout migration.

The next morning I stood in the driveway finding it hard to go indoors. Blue jays were deep in vocal exchanges in the trees. Like crows, jays become very garrulous on resuming their social life in the autumn after the constraints of the breeding season. These were carrying on in a conversational undertone of quacking or "queeking" with now and again voices raised in a harsher, louder discourse. Surely this was truly talk! "Purty, purty, purty," one would say. What could it mean? Suddenly an outcry from them heralded trouble: jays are great ones for rousing the woods to danger, not, presumably, because they are sharper-eyed than other birds, but because where others freeze in silence they yell to high heaven.

Trouble fluttered in fast through the trees in the form of a sharp-shinned hawk, which put down on a branch above the driveway. Patterned in brown and larger than the jays, it was a young female. But the hunting had been spoiled and without wasting time she crouched, was off and had sped away. A bay-breasted warbler I had been watching, with some of the bay remaining on its flanks, had simply evaporated, not to be seen again.

Most small birds do their main migrating at night. From radar observation, it would appear that they fly usually at between 1,500 and 3,000 feet, though migrants traced by an aircraft carrier crossing the Mediterranean sent back echoes from between 4,000 and 6,000 feet. In darkness the migrants are safe from hawks, at whose mercy they would be by day. (In Europe, Eleonora's falcon, smaller than a peregrine

across the sky, they fill the woods with a discordant symphony of cluckings and shrillings.

With wings spread like an Indian chief's bonnet, a junco is stopped by a shutter in midair.

and proportionately longer of wing and tail, which is skilled at capturing and consuming prey on the wing, nests semicolonially on rocky Mediterranean isles, beginning in midsummer, to insure its young a supply of autumn migrants attempting to cross the sea and having no means of escape.)

But what is probably of equal importance to safety is that by migrating at night, normally diurnal birds leave the day free for feeding, which darkness would preclude. Swallows, swifts and nighthawks, which capture their fare on the wing and can feed as they go, and are strong flyers besides, migrate by day. So, too, does the kingbird, "always active and exuberant," as Jean Dorst, of the Muséum National d'Histoire Naturelle in Paris, says; its migrating flocks of up to several hundred are conspicuous in Central America.

Bands of blue jays winging by at 100 or 200 feet in businesslike silence against a sky matching their azure are as much a part of autumn's rites in the East as the incarnadining of the multitudinous woods beneath them. But of all migrants the most difficult to overlook are the grackles. Beginning as a rule in late afternoon, they come by in rivers overhead, also usually at between 100 and 200 feet, from horizon to horizon. Last year there was one of these processions as early at July 19th. "Grackles have been everywhere in the past four or five days," I wrote on September 22nd, "pouring over the fields and through the trees to settle briefly on the branches, adding black foliage to green, or to forage over the ground, filling the woods with soft cluckings, gratings and shrillings."

To spend the whole day lying on one's back on the grass, I thought, would be the thing. There would be the luminous blue of the sky to watch for nighthawks that come by on wings that seem to work on springs; swallows of our six species; hawks passing swiftly in power flight at treetop level or, with sails set, circling serenely in a buoyant, southward-drifting cushion of rising warm air; perhaps a loon streaking by like a flying bow and arrow.

Oh, to a watcher of the sky anything is possible: a white ibis, a raven like a black cross, an eagle in lordly disdain of the earth. And looking up into the trees at the wood's edge for warblers to materialize, three or four together, may be as good a way to catch them as to go seeking them out. One who knows how difficult it can be to spot a butterfly-colored male in spring, singing its head off in the crown of a tree only half leafed out, can appreciate what the odds are against noticing one of the little sprites as it moves in silence, rummaging restlessly through the heavy foliage of September. When you do detect one, you still have to

pray that it will hold still in the open for the two seconds you need to get your glasses on it and its image on your retina, and that it will not prove to be one of those greenish or tannish indeterminates that do not quite correspond to any picture in the field guide.

All these uncertainties are comprised, for the birder, in the term "fall warblers." And when we speak of going out for the migration, it is above all (among the small land birds) the warblers we have in mind. In their number of species as of individuals, in the floral variety and brightness of their colors as in their delicacy and animation, they are a birder's delight; in the mid-Atlantic states there are some 35 species he has a good chance of seeing in May or September. They have his gratitude, too, in that their songs give him the means of identifying them even when they cannot be seen. (Said an uncle of mine to stimulate my interest in Wagner when I was 14, "Think of the motifs as warbler songs.")

But after the breeding season most male warblers lose their brilliance of color, which the juveniles, who outnumber them, have yet to acquire. On the southward trek, moreover, instead of coming through hard upon one another's heels in about a month, often in a wave when favored localities will be alive with them, the warblers drift through undramatically and nearly voiceless during a period almost twice as long. So when you say "fall warblers" you explain why for every five or ten birders in the Arnold Arboretum, or in Central Park, or on the Chesapeake and Ohio Canal on a May morning, there is only one on a morning in September.

Yet many birders, if they had to settle for one season or the other, might well choose autumn. There are more birds then, and the erratics are likeliest. Some displacement of migrants to east or west is apt to occur both spring and fall, but the postbreeding season is, above any, a time of wandering. Now, too, for those of us in the East, is the best time for strays from the West —though the excitement of recording one must be offset by knowledge of the fate that probably awaits it.

Recalling how, one August, he had seen three western kingbirds perched on electric wires along a road on Monhegan Island, some 16 miles off the coast of Maine, while friends of his had seen two others elsewhere on the island, the able nature columnist Irston Barnes comments that "instead of flying south, these birds had flown northeast," and judges that "for all practical purposes such birds are permanently lost. They probably do not have any means to correct and set a new course." What is most extraordinary about his report is that there were five of the aberrants. Since it is hardly conceivable that the internal compasses of all five would have been off just so much as to bring them to the same place 1,000 miles away, it must have been that four of them followed a misguided fifth.

Perched across the bottom of these two pages, resplendent in their bejeweled coloration, quiescent and yet vibrant with life's heartbeat, is a panoply of birddom. From far left, and in order, are:

The East Coast may for another reason be favored in late summer and early autumn by visitors many hundreds of miles out of orbit. That is the season of hurricanes. Caribbean seabirds caught in the eye of one of these circular storms will, rather than fight the 75-plus-miles-per-hour winds raging around it, accompany the relative calm of the eye as the storm pursues its course until its winds eventually diminish or it moves inland, and end up as notable vagrants on some fortunate birder's checklist.

But autumn has more with which to move us than the spectaculars it may bring. Stand out-of-doors at night in September and hear the call notes faintly raining down from the dark sky, some recognizable, like those of thrushes and the "peents" of bobolinks. Let yourself visualize the little forms peppering the obscurity, winging all in one direction, high above black forests and fiery-glowing towns, above rivers, bays and seas shimmering like dragon skin in the moonlight. There is poignancy in the matching of insignificance against overpowering distances of as much as thousands of miles for some of the migrants; and this is especially so in autumn when as many as half or more of the hastening specks, cheeping in exchange of assurances, are only weeks old and on their way, as Barnes puts it, "to an unknown destination by an unknown route . . . impelled by forces which they do not understand."

Then if you back away far enough to see in the mind's eye all North America and the vast breadth of Eurasia, there is as much drama as you can encompass in the draining southward of dustings of birds rising from, passing over, settling upon every shore, waterway, fen, marsh, spinney, meadow, heath and acre of forest the hemisphere around, clamorous or silent, by ones and twos and by thousands—hummingbirds, larks, cranes, waterfowl—in a living tide not otherwise exampled even in great hidden realms of the deep.

The Southern Hemisphere, we may note, witnesses no such phenomena—though that domain of the oceans has its own version in the seasonal movements of its myriad myriads of seabirds. Below the equator, few considerable landmasses obtrude into the middle latitudes, and of those that do, only the narrowing South American peninsula has winters slightly comparable to those assailing the immense territories of the upper northern latitudes. Some species desert Tasmania and southern Australia, a few reaching Indonesia. Many South African birds migrate the relatively short distance to the Congo and Tanzania and many from lower South America to the broad beam of the continent; two Patagonian swallows make it to Central America and even Mexico. But not a single land bird of the Southern Hemisphere—or any other but a few petrels—has the migratory impetus to carry it through the tropics to the summer temperate zone, as so many birds of the Northern Hemisphere have.

By the last week of October, autumn's final chapter is under way. On the 19th, at the epitome of its glory, the first white-throated sparrows appear while the two kinglets are still much in evidence—tiny creatures so compact as to be neckless—and the last olive-backed thrush is at the birdbath. From the bank of the stream a winter wren skedaddles—a dark little peg-tailed gimmick; you would think it would be lonely. The next morning the fields are rimed in four degrees of frost. A heavy fall of leaves follows. Hard freezes on the 21st and 22nd bring the first juncos and a brief stopover by two hermit thrushes in the dogwood near my window. Silent in movement as two small brown shadows, motionless in repose after the characteristic lifting and subsidence of the tail on alighting, the thrushes seem mere thoughts of birds, as yet uncorporealized. The hardy myrtle warblers have acquired the appear-

a Canada warbler, a northern oriole; a tufted titmouse;

a summer tanager; a female belted kingfisher; a predatory

sharp-shinned hawk, true to form, with a hapless evening grosbeak.

ance of winter birds in brown, furry-looking plumage.

There are reprieves. On October 28th a horned grebe, bird of the rough winter seas, is to be seen on the river and, nearby, the first group of the raft of ruddy ducks that winters here—so many floating teapots with tails for spouts. The day is mild and sunny, an extension of spring's lease.

But for all its color and excitement and regretful looks backward to times of song and flowering, autumn is a losing season.

Yet all is not over. It is for this stage that nature reserves a crowning demonstration, heralded by one of its great voices. The sound is one you are seldom immediately sure of, when the first audible presentiment comes downwind of a clamor in the northern sky. The geese! It is out-of-doors then in a rush. What a summons it is, that high, broken, incessant baying out of the wild and solitary spaces of the north, like the sounds of an army returning with battle honors from a frontier beyond the imagination of stay-at-homes. And there they come, the dark, strongly beating forms, forward-striving in the outstretched necks, all in one rank, wing tip to wing tip in that extraordinary, broad V-formation—an incredible sight in the humdrum sky above the suburbs. Cry havoc! No, it is not havoc they cry but the untamed and untamable, the unquenchable springs of our common vitality, clarioned in the heavens by the passing phalanx that all may hear.

Only the setting-in of the hard freeze in the north could send those stalwarts southward down the sky roads. When the Canada geese come through, winter cannot be far off.

Heralded by one of nature's great combined voices, a skyful of geese begins its annual migration.

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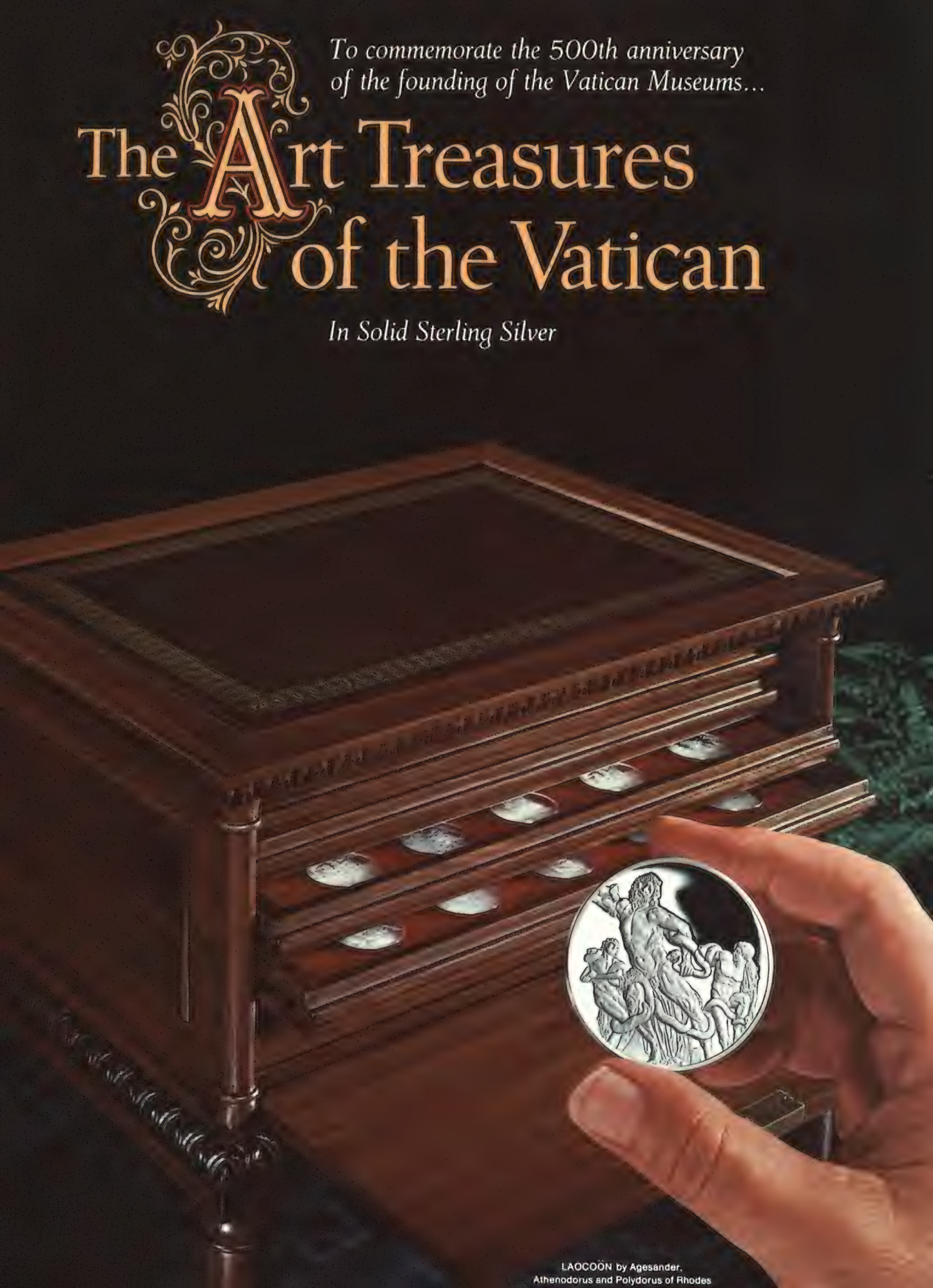

LAOCOON by Agesander,
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By Margaret Lantis

As times change, so do signs, signals adopted by youth

In a half-generation the country has gone from the clenched fist and violence to 'hang in there.' Psst, it seems quiet now

In looking back to the great youth upheaval of the Sixties, we generally think it all started in Berkeley, California. Because I was there in 1964-65 as a visiting member of the university faculty, and because one of my interests is America-watching, I began to look at what became—on and off campus—a great national passing show. Let's watch it, passing step by step from the scene and mood of Berkeley then to the mood of anywhere this year. A momentous ten-year trip it is, some years bitter, some enlivening and exhilarating, and to many parental sideline observers, puzzling.

The epidemic of sit-ins and teach-ins—and of violence—did not happen to us unforewarned. We should not have been surprised—although we were—at what "good" kids were doing in the early 1960s. If we had looked more wisely at the graphic materials that were becoming symbols of the period, the signs and gestures created to express real emotional needs, we might have sensed the students' mood.

(Perhaps now we are more aware. This summer the Smithsonian's Renwick Gallery in Washington has an exhibition titled "Signs of Life: Symbols in the American City." It shows the evolution of symbolism in the 19th-century city, in the home, and on the modern commercial strip.)

Grant Park, Chicago, during 1968 Democratic convention. Defiant protestors had been tear-gassed.

Back in the 1940s, on ashtrays and wall plaques we had "People Are No Damned Good," muttered by a dour figure in a box shutting himself off from people. By 1962 Jules Feiffer, whose cartoons appeared in publications that students read, already was playing the role of bitter-humorous social critic. And through that whole period there was "poor old Charlie Brown," who wanted, expected and tried to win, yet lost every ball game: Charlie Brown, characterized on the 20th anniversary of *Peanuts* in 1970 as "a basic reflection of his time." His creator, Charles M. Schulz, has said, "When I first started Charlie Brown, I didn't know he was going to lose all the time."

The October 1961 issue of *Harper's* magazine had a special supplement on *The College Scene*, with articles on sex (*The Problem Colleges Evade*), religion, young black rebels, and inadequate teaching (*The Wasted Classroom*). Although accompanying photographs show that both boys' and girls' hair was short, one picture shows students listening to a young soapbox speaker who was motioning toward a sign, "Columbia students for a sane nuclear policy." That should remind us: what became the familiar "peace symbol" was originally "Ban the Bomb."

One of those who *were* paying attention to the signs of the time, Philip Rieff, wrote in that issue: "What of the young themselves? My own experience of them . . . indicates to me that they are well aware of the role into which they have been cast. They have been told, often, that their elders have become both disenchanted with ideologies and lacking in ideals. And, for this good reason, they refuse to listen to anything else we have to say. . . . They neither heed . . . their fathers, nor destroy them. Lacking continuing leadership, they play a fickle game of father figures."

A university too big for comfort

Their professors concurred that students had no interest in or sense of history. To them, the past was irrelevant to their modern world.

For Berkeley students in the mid-Sixties, leadership, with the essential accompanying slogans, did not come from their potential father figure, Clark Kerr, president of the massive University of California, whose article, *The Multiversity*, got much attention in 1963. President Kerr was, above all, an administrator, the top man in a knowledge industry; he had some understanding of and sympathy for its human products, but in the students' opinion one of the things wrong with U.C. was that it *was* a huge multiversity, like a Washington bureaucracy or a multinational industry. Instead, leadership developed internally, on a free-speech issue. This concerned, first, signs bearing a then-unmentionable word and, next, tables with placards

In the mid-1960s this new symbol, shown in Day-Glo color, stood first for Ban the Bomb, then for peace, finally became a "knock off violence" pendant.

and signs representing various "causes" that students and evidently some nonstudents set up at the most-used entrance to the campus.

To many local people, the unexpected sit-in in the fall of 1964 looked like an overreaction to denial of a minor demand. Some of the students, however, reacting against their own feeling of uselessness, had been seeking to do something worthwhile by fighting for personal rights—other people's rights if not their own. SNCC, CORE, and Students for a Democratic Society were in place in 1963, putting many students through rehearsals for the big scene.

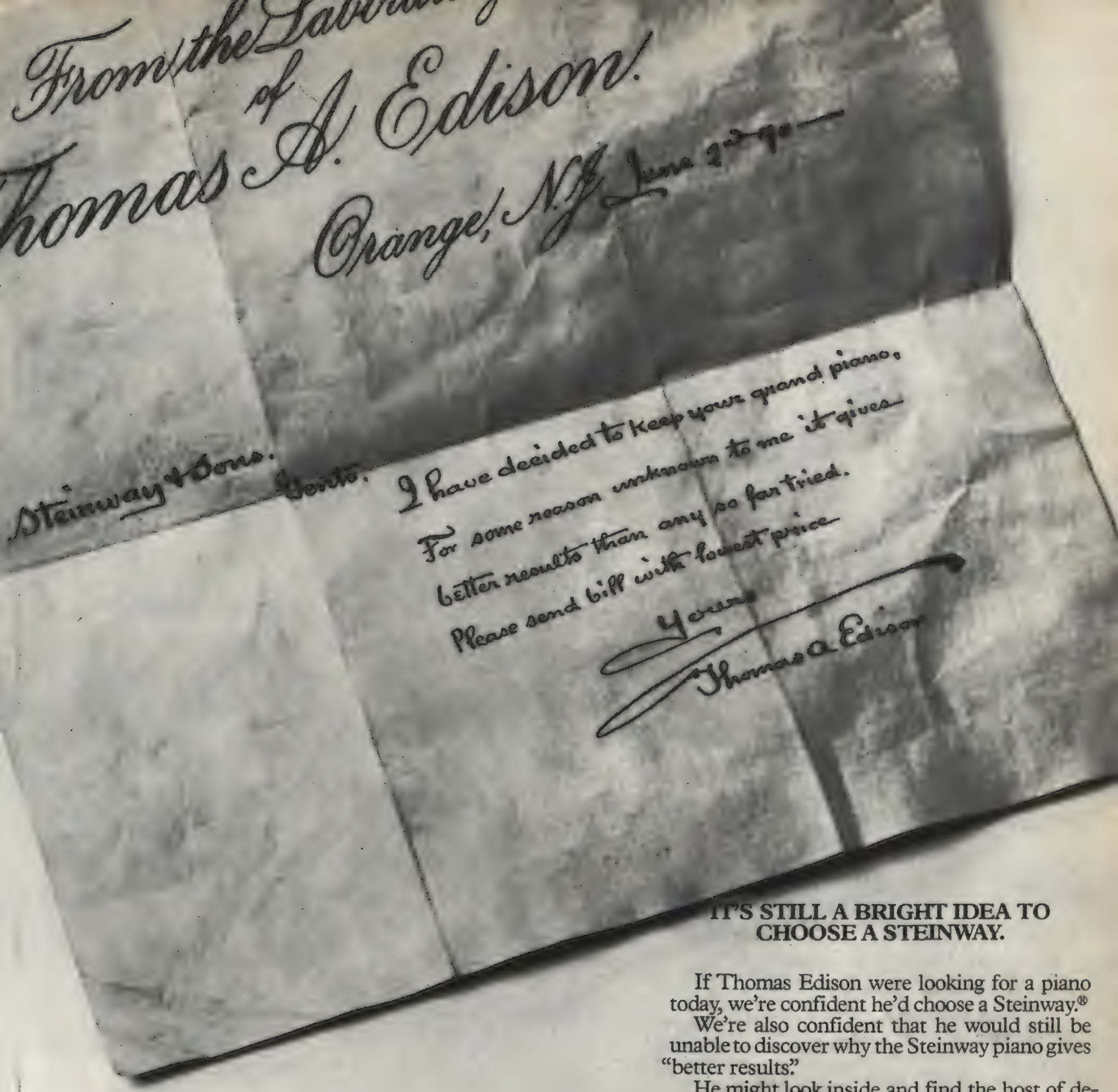
Across the country at Columbia University, according to a former student, "we started off gently, joining the Peace Corps, going on freedom rides into the South. But [in 1968] after several years of this, those of us who stayed active weren't so gentle anymore."

The transfer of activism from Southern roads and Northern city streets to the campuses did not begin solely at Berkeley. In the spring of 1965, some University of Michigan faculty held an all-night seminar to discuss with students the question of U.S. involvement in the Vietnam war. Soon many universities held teach-ins and Dr. Benjamin Spock, Senator Ernest Gruening (the first Senate dove), Norman Thomas, Dick Gregory, Joan Baez and others participated.

The many who congregated as onlookers, or who set up their tables or carried placards, were rather quiet and thoughtful, and the "in" signs were, frankly, not very graphic. The stark upraised fist (right), which needed no words, had not yet appeared. Some signs were wordy, others succinct, such as "Impeach Lyndon Johnson!" But still not the dove of peace nor the two fingers in the V-for-Victory sign. It was much too early for even a hope of success.

Compared with the next year, 1966 simmered: it occasionally boiled but did not explode. In 1966, what

"Right on," originally a loud, ungrammatical term of black aggressiveness, turned into a multiracial slogan: you're for what's right and so, by heaven, am I.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became a universal subject of youth protest—the Vietnam war—was not yet taken as the prime target. College-age people were symbolically shooting in many directions at once.

The Beatles, who had entranced the young in the earlier Sixties, were still touring; the musical *Hair* was proliferating; and the shagginess of these two was becoming on nearly every young head the defiant pennant of the youth revolt. Along with the supposedly new realism there was, however, fantasy.

From 1964 to 1967, Snoopy all but monopolized *Peanuts.* Although there was the pathetic fantasy of Linus' Great Pumpkin, this could not be sustained the year around, while Snoopy's imagined characters could be assumed day after day. He tried out various roles of accomplishment and heroics until, as "the World War I flying ace," pitted against the Red Baron, he hit the right note in 1967, just when war became hateful. As with Charlie Brown's earlier attempts to win which ended in the reality of an incompetent team, so from 1965 to 1969 fantasy was fun—until reality intruded. The big concern of so many young men (and their girl friends) was how to stay in school to avoid the draft. The war was a personal threat. The wry message that young people sensed but their elders did not receive: wartime heroics are laughable.

In 1966 and 1967, all the lines of growth flowered in buttons. Here is a sample:

I ate my Draft Card	Send a Cop to Camp
i is ignorant	LET'S GROW HAIR
Organize an Orgy	Let's Eliminate Monday
Kiss now—worry later	ABOLISH KIDS
NIXON FOR NOTHING	Pass the Pill
I am a Peace Monger	I CAME I SAW I LEFT

The crescendo was played in 1967, the climax in 1968 and 1969. The terrible ghetto riots occurred in 1967. These were not symbols as we usually define them; the riots were the real thing.

A choice: violence or "Flower Power"

On the national chart, as one line of interest rose toward its peak, another was starting locally and much farther down. Summer 1967 was the "Summer of Love" in San Francisco with the burgeoning of the Haight-Ashbury hippie community. This interest would spread and rise, merging with the ecology movement.

But the next year was grim. By June 15, 1968, there had been, by National Student Association count, 221 major demonstrations at 101 colleges, with the Columbia University sit-in "by far the most spectacular." Most sobering of all, both Martin Luther King jr. and Robert Kennedy were assassinated. The confrontation of New Left activists (the Yippies of the Youth International Party, the Mobe of National Mobilization Committee to End the Vietnam War, and others) with the Chicago police at the Democratic convention was, as we all remember, violent (p. 72). Young people reacted by taking one of two courses; they became grim, cynical, more violent, or they turned to "Flower Power," not yet fully identified as such, but growing.

A macabre variant of a World War I recruiting poster told young people they did *not* want to be wanted.

In 1969 graphics appeared all over. The peace symbol and the upraised fist were now common, in many forms. And posters! The variety was astonishing. They presented not only "Ban the Bomb"--they presented L O V E, at times the Beatles, of course pinup girls (generally featuring large breasts), psychedelic geometrics entitled "Gates of hell," "Trips," "Out of step," "No exit," "Target." There were reproductions, now given a new meaning, such as the old poster of Uncle Sam pointing (above) and saying "I WANT *YOU* FOR U.S. ARMY." Among art posters, Picasso was prominent and enduring: his *Don Quixote, The Dove, Harlequin, Les Petit Fleurs* (sic). Finally, mandalas (Hindu or Buddhist symbols of the universe), advertised as "sacred meditation symbols," appeared.

Perhaps the most subtly revealing was the old photo (p. 78) of W. C. Fields, hatted and gloved, peering in a secretive and calculating way over a hand of cards. The old, roguish iconoclast made defiance of the

Margaret Lantis, a professor emerita of anthropology at the University of Kentucky, has pondered the meaning of student signs and symbols for 15 years.

mores appear amusing. The kids would have been merely impudent or smug like Fields if they hadn't been so earnest about their waywardness. Anyway, he became one of their symbols.

Pullover shirts with large designs that made them look like posters appeared. One company offered four: Peace ("our best seller"); clenched fist under STRIKE ("official Harvard strike shirt"): YOUR THING; and a woman's zodiac nightshirt ("it's lucky to wear your sign"). Note the zodiac nightshirt: because of the song in *Hair*, Aquarius behavior became a theme. Aquarius in that period was defined as "calm, introverted and seldom angry, you are freedom-loving, and like defying popular opinion with your unpredictable ways."

There was liberal use of the national flag by supporters of Richard Nixon, who was opposing the anti-war movement (they also used bumper stickers: LOVE IT OR LEAVE IT). Soon, however, there were flags on the seats of bluejeans.

Within the youth society, vibrations for the ears, as well as the eyes, drew protesters together. They moved on pounding waves of sound. Periodically, hundreds and even thousands got high as a rocking sleepless mass, benumbed by wine or beer, marijuana or LSD, and always by music. Like the signs, music was symbolic and a means of communication as well as a justification for congregating and communing.

Except for *We Shall Overcome*, there were in the Sixties noticeably few rousing songs that became well known to the older public. Did television induce the protesters unconsciously to present their mood and message graphically to their parents, to their critics? With their hand-lettered placards, were they not so much telling themselves as telling the world?

The moon flight in the summer of 1969 excited and inspired for a while, but a trip to the moon was soon regarded as something very carefully planned and controlled. Life for most young people was just the opposite. It was filled with uncertainty, some of it exciting, some anxiety-producing: chancy efforts to escape the draft; experiments with psychedelic drugs; brushes with police, at times ending in being "busted"; and experiments in new living arrangements.

Earlier in the decade the poor people and blacks had carried to Washington their protests against disadvantage. Then the students moved from campus to capital. The defiance became serious and strong.

In November of 1969, 250,000 people rallied and marched in Washington to protest the Vietnam war. The nation read on the nightly TV newscasts the signs

W. C. Fields hated babies, in or out of toilet bowls. Here he contemplates cheating—and why not?

It was rather pathetic: the baby too little or the toilet bowl too big. Either way, life was a bummer.

they carried: "Not one more dead" and "Vietnam Vets for Peace." We looked at the casual dress and the hostile or triumphant gestures of the marchers.

If the first earthquakes occurred in 1969, then the Kent State University deaths in 1970 set off other severe shocks that swept through the colleges as fast as seismic waves. At the University of Kentucky, where I was then, an old frame building assigned to the ROTC was burned and similar lurid events occurred elsewhere. The tragic explosion in the physics laboratory at the University of Wisconsin was not by any means the only bomb explosion that year.

Two movements, one growing, the other reaching a climax, moved along together: environmental awareness teach-ins and seminars and (in April) National Vietnam Week activities. In May came the unplanned reaction to Kent State. There was a third movement: women's rights. Its symbol, used for example by the women's movement at Yale, was the fist combined with the medical symbol for female.

By the end of the year, the ecology movement had added nature to the themes. "Save Our Earth" was the slogan in 1971. Pictures of woodland scenes and love pictures of the arms-around-each-other type were appearing separately and combined.

On the overall bib of a girl student at Lexington, a plethora of buttons, c. 1976. But no message.

Along came, for a while, The Smile

In 1972 and 1973 there was a beneficent mood: the Jesus Movement, with its misnamed Jesus Freaks, the generally harmless play-acting witchcraft (there were student covens), yoga, new meditation or chanting cults, student volunteerism in welfare and education, the collecting of old newspapers and cans, cleaning riverbanks, attending local hearings on dams or rezoning or anything affecting the Earth's face. And the well-meant but overworked exhortation "Have a nice day" which even appeared on bumper stickers. The ancient Egyptian symbol of life, the ankh (*crux ansata*), became popular as a pendant and on rings.

The graphic symbol that swept nearly all others off the student bookstore shelves was the Happy Face: round, simple, bland, without any individuality. How could those vociferous young people of three years before, who had enjoyed the angry or impish or Establishment-taunting phrases and gestures, buy and wear this smiling stereotype? Having run the course of rebellion, having accomplished something by expressing many Americans' reaction against the war, now blandness evidently was what they needed and wanted.

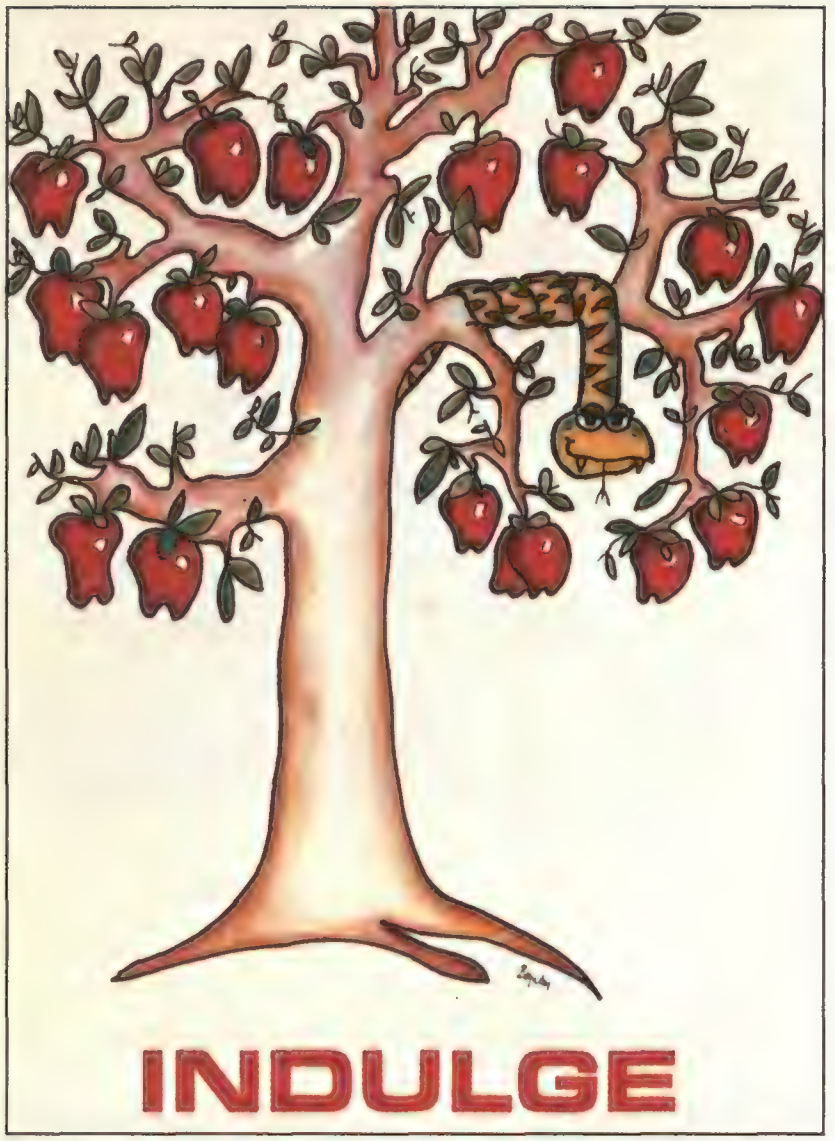
As usual, many students wanted only to survive. They were not hitting the highways; they stayed in school. But they were not revved up by ambition. Get through the courses, get the degree, and get out. Regarding other than professional courses, I heard them saying, "It's a drag. You don't learn anything useful. But if you've gone this far, you might as well stick it out." Smile. Endure. One animal poster that was becoming popular in 1972-73 expressed it: a simple photo of a bewildered kitten hanging by its front paws on a bar, with the caption, "Hang in there, Baby."

By the end of the 1972-73 school year, the smiling face was no longer acceptable on campus although it survived a while in the commercial world. (In 1974, the manager of one student bookstore told me, "If you think it isn't dead, look at all the T-shirts with the smiling face that we can't sell now.") Although college youth had no part in the Watergate exposé and legal action, there was a feeling—as with the remainder of the citizenry—that solemn, very sobering events had occurred. The mood had changed again.

What is acceptable ten years after Ann Arbor and Berkeley? Of the forms that we have been considering —comic strip characters, abstract symbols, semiabstract forms like the peace dove, and the drawings and photographs on the posters—there developed through 1974 into 1975 a meaningful new combination of very old forms among abstract and semiabstract symbols.

During the Christmas season in my university town, "Hang in there, Baby" remained popular in the largest boutique, but most in demand was a picture of a baby sitting in an adult-size toilet bowl, with the caption, "Life's A Bummer!" (p. 78). Said the cashier "We couldn't keep enough in stock!"

This followed the period of the first big energy



No Adam, no Eve, but an Edenish apple tree and snake, c. 1976. The message: relax, enjoy, indulge.

crisis, the automobile sales slump and employee layoffs. Many people had a sinking feeling—like the baby, they were in something too big for them.

In that winter, enlightenment—regarding the current type of symbols and their expressive power—came to me in the jewelry stores. In different sizes of shops in various towns, the story was the same. Among bracelet charms and neck pendants, the big sellers during the Christmas season were crosses and zodiac signs. In answer to my query, one salesman exclaimed, "Crosses! All kinds! Zodiac signs—very popular!"

Next in popularity came St. Christopher medals ("not only Catholics have been buying these") and the Italian horn, the latter originally a counter-charm to protect one from the evil eye. There was some demand for the fisherman's or Ichthys cross, also for good luck and protection; the Star of David, the Hand of Fatima, Southwest Indian jewelry, even a few star and crescent pendants, and small gold mezuzahs but without the scroll that a real mezuzah should contain.

We are interested in both form and meaning. All these forms are unquestionably very old. For most of the modern users, the meanings probably are basically the old ones, although the symbols may have a more generalized meaning of protection, of good, provided by Christ or Providence or the stars, rather than protection in special circumstances. In periods like the recent pervasive economic insecurity and of general anxiety, people turn to what "is known to have had" power in the past, magical or spiritual. As Max Lerner has written, "A heritage is at any moment a selection of symbols out of the past."

In 1975-76, there were mottoes not only on wall plaques but also on boxes, tiles, even coffee mugs, usually combined with pictures of little girls in sunbonnets, pinafores and high shoes. Flowers and house plants in decorative pots became a big thing. There was much talk of nostalgia, of going back to the Fifties when life was, supposedly, simpler and more secure. In movie tastes and clothing styles, young Americans turned to even earlier times. The return to the past has been literally spelled out on the plaques. Whether one calls it sentiment or wisdom, it radiates from flower-and-scroll bordered reminders like these:

> May we always have old memories and young hopes. Live for Today, Dream for Tomorrow, Learn from Yesterday. Lord help me to be slow—slow to anger—slow to condemn—slow to walk that I may not pass one who needs me.

It appears that the youngsters, and some not so young, being faced for the first time with the anxieties of their grandparents, were trying, without conscious intent, to re-create in a small way what they thought was their ancestors' world, wild West or staid East.

While violence has appeared to be growing in many high schools, the colleges have been quieter. At my university a bookstore manager said: "The students' attitudes have changed, too. They don't look so scruffy. They don't rip me off as they used to." A professor's statement of satisfaction: "I've had good attendance and good response in class. This is happening generally."

Symbols are not fads even though they wax and wane, unless one thinks that life is just a series of fads. I don't think that. The changes that create new symbols or revive old ones are important changes in the circumstances of our lives and in our responses.

To use an erstwhile common phrase, when they "got it all together," students could write on the wall, "Life's a bummer, but hang in there. We'll survive, with luck and love and—a little effort." In no small way they prepared the nation to accept and enjoy the Bicentennial celebration. We'll just have to wait to find out what may be germinating for the next period.

Some situations are constant. At the University of Kentucky in 1976 this is a reassuring sign.

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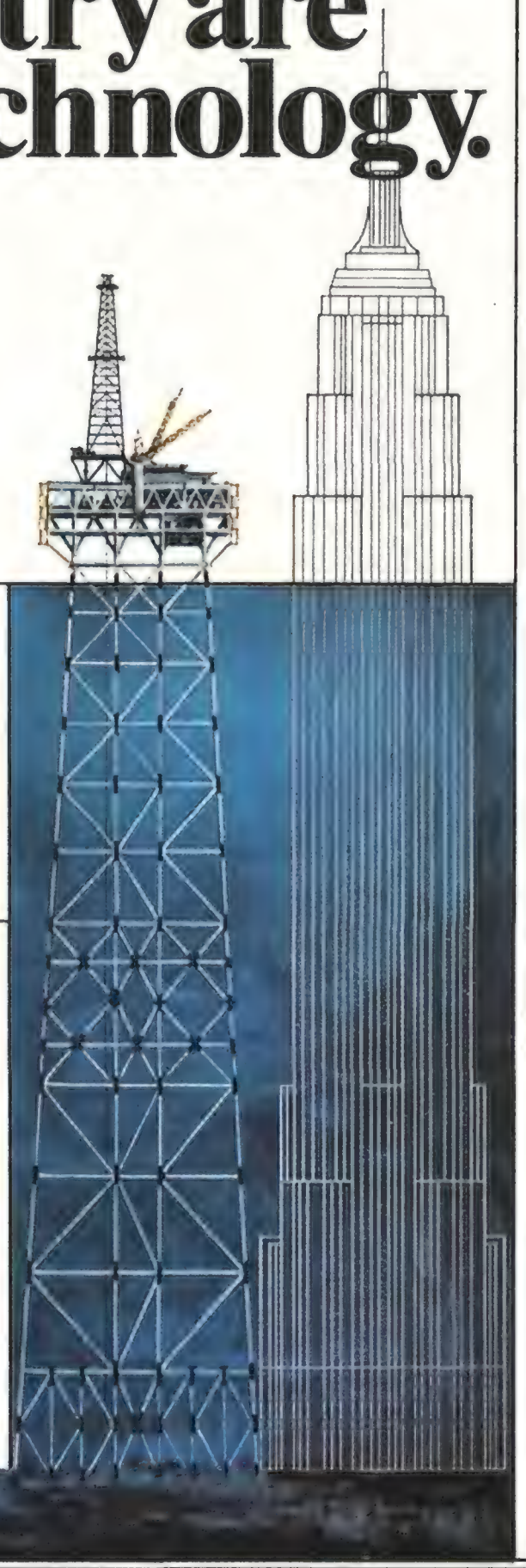

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Today, the men and women of Exxon are still working hard to provide more energy for a strong America.

rong America

By Wilson Duff

Mute relics of Haida tribe's ghost villages

Totem-pole fragments are all that remain at Northwest Coast sites like Ninstints, where fierce Chief Koyah ruled in splendor

Forest of totem poles faces seaward at Haida village of Skedans, in Queen Charlotte Islands. Picture

The large wooden sculptures known as Northwest Coast "totem poles" may be seen on display in many of the world's museums, but very few are left to be seen at their original native locations. Weather, decay and fire—in addition to the collectors—have taken their inevitable toll of these century-old cedar monuments, and recent surveys of Indian village sites in British Columbia and Alaska have found that the surviving remnants are now beyond hope of salvage.

The time for collecting and preserving these sculptures is past, and on a dozen remote and long-deserted village sites the ancient remains—fallen poles, house timbers, grave monuments—are slowly disappearing in the encroaching forest growth. These are melancholy but strangely exciting places to visit. One of the most impressive is the Haida village of Ninstints on Anthony Island, near the southern end of the Queen Charlotte Islands on the coast of British Columbia.

Part of the excitement lies in the remoteness of the island itself. Exposed to the open Pacific in the western entrance to Houston Stewart Channel, stormbound much of the time, it seems an unlikely place for a major village. The warmth of the ocean keeps the temperature remarkably moderate the year round, but high winds from the constant eastward flow of storms keep the waters rough most days of the year. Ninety-mile-an-hour winds are not uncommon in wintertime, blowing sheets of rain and salt spray that scour the faces of humans, houses and totem poles. The region gets about 60 inches of precipitation a year, only about half of what falls on the forests of the Olympic Peninsula nearly 400 miles to the south, but for overcast months on end the weather is either getting ready to rain or raining or getting over a rain.

It is a high tribute to the maritime skills of the Haida that they could survive there at all. They called it Skung-gwai, "Red-Cod-Island." In fact, it is a little cluster of islands lying north-south, the largest being a mile-and-a-half long and half-a-mile wide. The village site is tucked snugly into a little cove halfway along Anthony Island's lee side, around a rock-enclosed pebble beach.

The site is a tiny miracle of sheltered microenvironment. It is entered through a narrow gap between rocky peninsulas, opening into a C-shaped beach, dry at low tide. It is sheltered from the prevailing westerlies by the width of Anthony Island; a short walk through the rock outcrops and scrubby timber takes you to the Pacific side, where the surf is constantly

was taken around the turn of the century; nearly all the cedar sentinels have toppled and rotted.

crashing on the open rocks. Such tranquil bays are rare on the outer coast, and must have been a welcome haven to the seal-hunting people who spent much of their lives on the seas in dugout canoes.

The way of life at Ninstints, as at many Indian villages along the Northwest Coast and its islands, must have been an abundant one. Whales and seals, salmon and halibut, clams and mussels and oysters were all plentiful. So were salal, salmonberry and other edible plants. With a wealth of natural foods at hand, the people had no need for agriculture and ample time for cultivating the arts (including, to be sure, the arts of war and slave-raiding). Their tools were of wood and bone and of laboriously fashioned stone. Their fishing lines were made of strong strands of kelp. Their clothing was made of animal skins and furs, and woven strips of pliant cedar bark. Altogether their existence was prosperous and, except for the arduous and dangerous ocean-going pursuit of seals for oil and meat, and for war-party adventuring, it was leisurely.

None of the living Haida elders knows much about Ninstints, because it was abandoned before they were born. However, we can get glimpses of its early history from the journals of the early maritime fur traders, going back to the late 18th century. The people of this village did not, apparently, meet the first European navigators to visit the coast, Juan Perez in 1774 and James Cook in 1778. But once the fur traders began to arrive, they soon opened up an active and friendly trade in sea otter pelts. The chief at the time was Koyah (the raven), and Koyah's sound became one of the main ports of call for the many vessels trading along the coast. It happens that for a brief period, thanks to the traders' logs and journals, we know a great deal about this chief.

Koyah was a proud and sensitive man, and was to become one of the truly tragic figures of the period. An unbearable insult that he received at the hands of

Color photographs by Robert W. Kelley

At Ninstints, a fallen mortuary pole bears the weathered carvings of a beaver and a frog. The

the Yankee captain John Kendrick set into motion a chain of events which were the closest thing to Indian wars on this part of the coast. In 1791 Kendrick was off the village in *Lady Washington* when some of Koyah's people pilfered his personal laundry, hung out above decks to dry. He ordered the chiefs seized, then bolted down the legs of Koyah and Skulkinants in a gun carriage until the stolen articles were returned and he had acquired all the furs that were in the Indians' possession.

The story of the insult seems to have improved with the telling: another captain was later told that Kendrick had taken Koyah and ". . . tied a rope around his neck, whipped him, painted his face, cut off his hair, took away from him a great many skins, and then turned him ashore." Koyah was now no longer a Chief, but an "Ahliko," or one of the lower class.

Koyah attempted to take revenge, but it backfired. The next time Kendrick came to the village, "in liquor" that day and careless, the chief and his people crowded aboard and took possession of his ship. "*Now* put me into your gun carriage," Koyah gloated, pointing to his legs. Kendrick stalled for time, then mustered a counterattack, slaughtering 40 to 60 Haidas. Koyah himself was wounded in the back, and lost a wife in the massacre.

In 1794 Koyah took part in the capture of two ships and the killing of their crews. One was an American brig taken at Cumshewa; the only survivor of the crew spent a year there as a slave. The other was an English ship which set into the sound in winter to replace broken masts.

No other Northwest Coast chief was involved in so many attacks on ships. He met his death—most likely it was he—on June 21, 1795, leading an attempt to capture the 80-ton sloop *Union* captained by John Boit. Between 50 and 70 Haidas were killed, including the head chief. Although called by a different name—"Scorch Eye," in Boit's account of this second massacre—it was most probably Koyah who died.

Captain Boit's own narrative of the fight gains in drama from the fact that he had only 17 men, including six Sandwich Islanders (Hawaiians), under his command at the time.

"About 40 canoes came into the cove, full of Indians, at least 300 men," he wrote. "I immediately suspected by their maneuvers that they meant to attack the *Union*. Called all hands to quarters. Eight chiefs were on board at this time, who began to be very saucy, and the war canoes kept pressing alongside, and the Indians getting upon the nettings. Scorch Eye [Koyah] began the attack by seizing Mr. Hudson, the second

Wilson Duff is professor of anthropology at the University of British Columbia in Vancouver, where some rescued Haida totem poles stand in a park.

standing poles at left have highly stylized likenesses of a grizzly bear and another beaver.

officer. At the same time the Indians alongside attempted to board, with the most hideous yells. However we soon paid them for their temerity. I killed their first chief, Scorch Eye, in the second mate's arms, while they were struggling together. The rest of the chiefs on board were knocked down and wounded, and we killed from the nettings and in the canoes alongside above 40 more when they retreated, at which time I could have killed 100 more with my grape shot, but I let humanity prevail and ceased firing. At 6 p.m. a small canoe came off from the village with two Indians in her holding green boughs (emblems of peace). I allowed the chiefs on board, who were thoroughly ironed, to hold converse with them. At dark they left us. Kept a strong watch, all hands to quarters, through the night.

"At daylight, took up the anchors and came to sail, stretching toward the village. . . . At 9 a.m. several large canoes put off full of Indians waving green boughs. They came alongside with fear and trembling, bringing plenty of furs to ransome their chiefs with. Ordered the irons off them, and called the poor devils up, and notwithstanding the treatment I had received I paid full price for the skins. Believe I got every piece of fur they had in the village. Took notice that the village was deserted. Suppose they thought it was our intention to destroy it. At 11 a.m. the canoes left, the Indians crying and praying for our success. Indeed the treatment they received from me was quite different from what they expected. Suppose in this fracas we killed and wounded about 50 but the Indians said we killed 70. None of us was hurt, but their attack was very impolitic, for had they instead of being so intent to board stood off and fired their arrows, no doubt they would have killed and wounded several of us. However, I was too well guarded against surprise for them to have been victorious."

Chief Koyah drops from history at that point. His dubious record of four armed clashes, two won, two lost, accounts for a great deal of the violence of the early maritime fur trade period on the Northwest Coast, which for the most part was peaceable.

A prehistoric art form

The chief who succeeded the tragic Koyah was Ninstints ("person equal to two"); but with the decline of the maritime fur trade after 1800 there are no journals mentioning him. In Haida tradition he was one of the highest ranking of chiefs, and his name was perpetuated as the name of the village.

No doubt both chiefs were memorialized by tribal carvers and perhaps at one time such sculpture could have been identified, but whatever form it took, it rotted away and faded from village memories long ago. It is interesting to speculate, by the way, on when and how the carving of massive totem poles began, in villages of the Haida and Tsimshian, the Kwakiutl and Bella Coola and Tlingit peoples. We know that the art form was already flourishing in the vicinity before the first visits by white men in the late 18th century. The tribes were still in the Stone Age, but they had some iron tools, probably obtained in trade with Asians around the north rim of the Pacific. In those days, any metal was a precious metal. The poles at Ninstints, incidentally, had to be towed to the village by canoe, for no western red cedar trees—the light, sturdy, straight-grained wood of choice—grew to suitable size on the little island.

The village was abandoned in the 1880s. In 1884, it was visited by Newton H. Chittenden from the government in Victoria, who recorded ". . . 30 inhabitants, 20 houses, 25 carved poles, and 20 burial columns." The few people who had survived the massacres and

Sections of a mortuary pole at Ninstints, on Anthony Island, show the face of a grizzly bear and below its protruding tongue, a human figure. Haidas placed their dead in boxes at the top of mortuary poles.

the epidemics of smallpox (introduced, of course, by the white man) moved to Skidegate and became Methodists at the mission there.

Over the years, the remote site has had relatively few visitors. Its decay and disintegration is recorded in photographs, beginning with those of Dr. C. F. Newcombe of Victoria in 1911. At some point a fire destroyed part of the village. In recent decades people have come to remove the totem poles. About 1940 five of the large frontal poles were taken to parks in Prince Rupert. In 1957 an expedition from the Provincial Museum of Natural History and Anthropology and the University of British Columbia removed parts of 11 poles, which are now on display in their museums. But the days of such depredations are over, and now the Skidegate band council and Provincial authorities are investigating what can be done to slow the decay of the ancient remnants. Anthony Island, which was never made an Indian reserve, is now protected as a Provincial park.

Haida totem poles are basically of two kinds: parts of the house construction and monuments to the dead; both serve as prominent displays of family-owned emblems. House poles are of two types: the towering frontal poles set against the peak of the housefront on the outside, and the shorter house posts of a few of the houses of the main chiefs on the inside. House frontals at Ninstints were as much as 40 feet high, and at more northern Haida villages they reached 60 feet. The monuments to the dead, facing the beach in front of the houses, are also of two types: the tall slim memorial poles, and the shorter mortuary poles capped with rectangular chambers holding the remains of the dead. Most of the poles left at Red-Cod-Island Village are mortuary poles.

Images defying interpretation

The figures carved on the poles in the bold Haida style are animal and human in form. Often the animals can be identified as raven, eagle, bear, whale, beaver, dogfish, frog, or some mythological creature, but almost as often there appear ambiguous figures or details which cannot be accurately interpreted with our present knowledge.

It is a mistake to say that totem poles can be "read" from top to bottom or any other way. It is more honest to say that we do not fully know how to decipher them. And it is one thing to identify what the figures represent but a more difficult thing to say what they "mean." Most of them are crests of families or individual chiefs: exclusively owned emblems of social identity and rank. From the writings of earlier generations of anthropologists, notably John R. Swanton of the Smithsonian Institution's Bureau of American Ethnology, we have

good lists of the former families and their crests. But Haida poles seem not to be just displays of crests of single families. On the frontal poles at least, they include crests of both husband's and wife's clans. The major figures are intricately interwoven, and minor figures—human, frog, bear cub—appear in mouths, ears and other small spaces. A knowledge of the myths is an important help, because some of the poles are "story poles" as much as crest poles. Raven, the culture hero and trickster, sometimes appears in one or another of his guises, and occasionally other mythical characters can be identified.

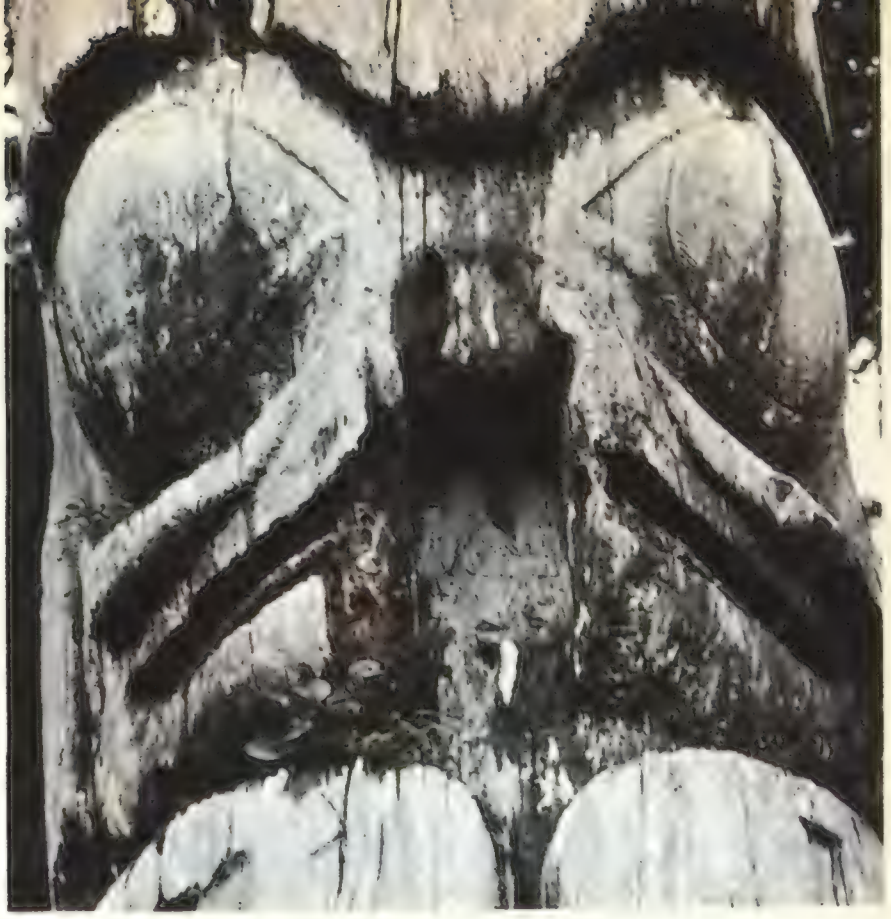
What remains unexplained is the extreme intricacy of the larger Haida poles. Each one is a deliberately different composition of major and minor figures. Uniformity of depiction and ease of identification were definitely not the aim of the artists. More seems to be going on than that. It is as though a more complex agenda was at work, having to do with deeper levels of meaning of the images and their interrelationships. But these meanings of Haida art, whatever they are, resist interpretation.

Perishing marvels of sculpture

Whatever the shallow and deeper meanings of the carvings on Haida totem poles, they are clothed in beautiful form. The cleanly cut lines, smooth curves, rounded and balanced forms, and harmonies of total composition have astonished European observers since the beginning. Every detail within the control of the artist was made to invoke an ideal of the beautiful. Whatever else they are, Haida totem poles are marvels of the sculptor's art, which adds to the poignancy in seeing them crumble back into the earth.

Such Haida territories, as I wrote in a Provincial Museum report, "are more deserted now than they have been for many centuries past. A few fragments of memory, a few bright glimpses in the writings of the past, some old and weathered totem poles in a storage shed, and the mouldering remnants of once-magnificent carved posts and houses on the site of the old village—these are all that survive of the tribe and village of chiefs Koyah and Ninstints.

"What was destroyed here was not just a few hundred individual human lives. Human beings must die anyway. It was something even more complex and even more human—a vigorous and functioning society, the product of just as long an evolution as our own, well suited to its environment and vital enough to participate in human cultural achievements not duplicated anywhere else. What was destroyed was one more bright tile in the complicated and wonderful mosaic of Man's achievement on Earth. Mankind is the loser. We are the losers."



Another mortuary pole at Ninstints appears to have an eagle as its main character. The beak is broken off. In lower picture a human figure is carved in eagle's curled tail; the tail feathers form a headdress.

Haida totem poles

A modern pole follows old carvers' fanciful artistry

The 42-foot totem pole at right stands in the Haida section of Totem Pole Park, on the wooded Vancouver campus of the University of British Columbia. It was carved at the park by William Reid, a Haida Indian, in 1960, a century after the pole it reproduces was created at Skidegate in the Queen Charlotte Islands. An accomplished modern-day artist in wood, Reid followed the basic design of the old, disintegrated pole, but in the tradition of Northwest Coast carvers added touches of his own. The legends below identify principal features of the pole, sculpted from a cedar tree four feet thick.

Dogfish tail

At the pinnacle of the pole soars the asymmetrical tail of a dogfish, a small, coastal-waters species of shark.

Watchmen

There are three, two facing left and right, one below them facing forward. Their presence atop totem poles was a prerogative of high-ranking chiefs. The dorsal fin of the shark passes through the face and hat of the central watchman.

Dogfish face

Below the central watchman appears the fearsome face of the dogfish shark. In its jaws it holds the tail of a small, upside-down killer whale. The dogfish species of shark was a common crest of eagle-clan chiefs of the Haida Indian tribe.

Eagle

The ears of an eagle appear below the face of the dogfish.

Sculpin

The talons of the eagle clasp a sculpin—an ugly little fish known in the area as a bullhead—and sculptor Reid has given the sculpin prominent horns for the fierce eagle to hold on to.

Killer whale

Largest image on the totem pole is the mask-like face of a killer whale. Enclosed by its flippers and pinned in by its split dorsal fin is a small human figure. It occupies a space where the doorway to the house would have been, before Indians adopted the white settlers' doorways.

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Past the church doors went Patriots disguised as Mohawk Indians with blankets, and hatchets, on their way to Griffin's Wharf. They boarded the Dartmouth, the Eleanor and the Beaver, split the tea-chests, and emptied 342 of them into the harbor. A friendly crowd looked on for three hours, that cold night.

George III and Parliament were openly defied. Couriers rode off to encourage resistance in other seaports. The American colonies moved closer to the Revolutionary War.

The stamps were designed by William A. Smith, of Pineville, Pennsylvania. The original steel engravings date from 1869 to 1879.

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By Karen Thure

Martha Harper pioneered in the hair business

How a servant girl with long, shiny tresses parlayed a little brown jug of hair-care formula into the famed Harper-Method beauty shops

Liberated 19th-century women were ready to enjoy a perfumed, intimate meeting place.

The American dream is for everyone—or so said the cherished 19th-century myth. However, the Horatio Alger successes were almost always boys. Yet humble girls did dream the American dream, and some of them climbed to the pinnacle of success just as surely as any Alger hero. Martha Matilda Harper was one.

The woman who was to become a founding tycoon of the multibillion-dollar beauty industry was born in a tiny cottage in Oakville, Ontario, in 1857. Her English-immigrant father, professing to be of noble lineage, emulated his reputed ancestors in his dedication to the hunt. While his purebred hounds grew sleek, his wife and family suffered. The number of Harper children is uncertain, but one by one, male and female, they were all probably "bound out"—that is, sent to a relative or neighbor to earn their keep.

Martha was bound out before she was ten. At this point her sparse formal education was for all practical purposes terminated: dusting and darning replaced reading and writing. But the refinement, poise, warmth and self-confidence described by people who remember Martha Harper bespeak a training beyond the domestic skills. Such characteristics probably came from the family of an old Dresden doctor in whose cultivated household she worked for some time. An important part of the Martha Harper legend is the doctor's deathbed bequest of the recipe for a unique herbal formula for care of the hair.

Besides instructing his precocious little maidservant in the complex preparation of his tonic, the old man taught her some revolutionary ideas concerning scalp hygiene. For centuries hair-washing had been a rare and time-consuming effort, largely owing to the lack of good soap and hot water. Powders and scents were employed to conceal the dirt and vermin often found in several pounds of long locks. Martha's benefactor taught her to clean hair by repeated brushings with castile suds, then to stimulate the follicles by vigorous massage with his antiseptic tonic. After giving the head a complete rinsing, Martha learned to comb the yards of snarls and brush the tresses shining dry.

The young girl probably practiced on the heads of women in the doctor's household; washing and styling the hair of one's employer was a regular duty of personal servants. However, it is evident that she also plied her skills on her own hair. In 1875, when she left Ontario to seek her fortune in Rochester, New York, her thick brown tresses flowed to the hem of her floor-length dress (opposite).

Besides her magnificent hair, the teen-age immigrant brought 60 hoarded silver dollars and a stoneware jug filled with the doctor's secret tonic. She knew no one in Rochester, but like thousands of other migrants, was replete with soaring hopes.

Through luck, or the astute character judgment that

Martha's beauty shop immediately attracted all the most respectable ladies in town.

later typified her business dealings, Martha found a position with a concerned and supportive family. When Mrs. Owen Roberts began receiving compliments on the new luster of her long, graying hair, she referred her friends to her hairdresser-maidservant. Soon Martha was brushing and massaging the elite heads of Rochester.

The little brown jug of tonic did not last long. In the attic of an old carriage house in the back of the Roberts' home, she began to manufacture new batches. Exactly what its ingredients were is unknown—one elderly beautician insists that a key component was marijuana—but its preparation required three separate boilings and coolings. So the plain-faced, hopeful girl in her early twenties labored in the carriage house, steam curling tendrils of her long brown hair.

The growing popularity of her hair and scalp treatments caused Martha to move her little business to a hotel room. Increasing profits enabled her to cast off her domestic duties and devote the next eight years to laying the groundwork for opening a beauty shop. The public beauty salon was almost unheard of in the United States of the 1880s. Barber shops, some operated by female stylists, had always been for men.

Personal servants fashioned the elaborate coiffures

When Martha left Ontario to seek her fortune, her thick brown hair flowed to the floor.

Illustrations by Brenda M. Tilley

of wealthy ladies until the early 1600s, when a temperamental shepherd named Champagne founded a beauty parlor in Paris, giving rise to a long line of male artist-hairdressers. Their salons, however, catered only to women of the court; not until the next century did ladies of the rising French bourgeoisie appropriate the luxuries of the beauty shop.

The rigors of life in Colonial America prevented early settlers from doing more than buying an occasional bottle of imported *Eau de Ninon de Lenclos* (named after a French courtesan who maintained her head of glorious hair to the age of ninety), and perhaps patronizing the local wig-maker. But 100 years later, things had changed. Wigs were out; elaborately styled hair was in. Flourishing prosperity, the rise of the middle class and the suffragists' persistent demand for female equality combined to produce in several places the sudden simultaneous invention of the public beauty salon.

Exactly whose beauty shop was first is unknown. Alexandre F. Godefroy, the French hairdresser who invented the electric dryer, emigrated to the United States in 1879 and probably opened a beauty shop soon thereafter. In 1888 the "Hair Dealers' Association of the United States" was formed in New York City; records indicate that some of its members operated salons. Modern Harper-Method franchisees, of course, insist that the initial beauty parlor was their founder's Rochester shop. There is no doubt that it was among the very first.

With $360 scrimped from her modest hairdressing fees, Martha Harper set about finding a suitable location for her new shop. She was greeted less than enthusiastically by Rochester's various building owners, all of whom shied away from the aura of scandal traditionally associated with cosmetic embellishment. Identifying beauty treatments with vaudeville actresses and ladies of the night, Daniel W. Powers refused Martha Harper's request for a ground-floor shop in his building. When she persisted, pointing to her carriage-trade clientele, he reluctantly agreed to rent her the space but refused to grant her a lease. Throughout Harper's 50 years in the Powers Building on Main Street in downtown Rochester, this stubborn old man continued to withhold her lease, always eyeing with suspicion "those fancy women and their beauty shenanigans."

But liberated 19th-century women were more than ready to enjoy the kind of perfumed, intimate meeting place the barber shop had so long provided to men. From the day it opened in 1888, Martha's shop attracted the most respectable ladies of Rochester, including, incredibly enough, the aging Susan B. Anthony, the indomitable Quaker suffragist.

Harper-Method girls were taught to relax customers, to help them enjoy weekly luxury, receiving not just a new hairdo—but peace!

Almost as soon as the Rochester salon opened, assistant operators were necessary. Martha recruited them from her friends in the servant class, seeking girls with pluck, grit, honesty and the ardor to rise to the top. As time went on she could quickly distinguish the applicant who would persist in the face of obstacles from the one who would be crushed. By 1890, Martha had five eager trainees. When she decided to open a second shop in 1892, she chose her top assistant, Bertha Farquhar, to pioneer the operation. Why she chose faraway Chicago for her new location is unknown. Possibly the decision was linked to the enthusiasm of Susan B. Anthony, who was at that time working on

Karen Thure is an assistant editor for the University of Arizona Press and partner in a videotape production company.

plans to represent the women's movement at the coming World's Fair. In any event, Martha helped her friend choose a promising location in the exclusive new Marshall Field building. While a plumber installed washbowls, a carpenter constructed several of Martha's original-design sled-type chairs, which enabled her patrons to lie on their backs while their long hair tumbled into the basin.

The Chicago shop was all the rage with the cosmopolitan ladies attending the Columbian Exhibition in 1893, and Bertha Farquhar dressed some of the crowned heads of Europe along with, of course, the modest silver bun of Susan B. Anthony. By the turn of the century this former domestic worker was numbered among Chicago's successful businesswomen.

Bertha's triumph inspired other ambitious servant girls, and Martha was glad to help them get started, so long as they passed her shrewd character evaluation. She never tried to change the personalities of her "girls"; one of the few surviving quotes we have from her enjoins us to "take people the way they are, not the way you wish they were, for we are all just as we are . . . even the skunks." Once Martha had determined that a prospective trainee was not a skunk, she would journey to her city, decorate her shop, lend her money, give motherly advice and, in her soft, encouraging voice, teach the same methods she had learned.

"Relax and enjoy your job!" Martha would admonish the nervous student. "Smile! You are doing something nice for someone! As soon as your patron feels

Martha helped her chosen trainees set up shop, repairing and redecorating the premises.

your sincere concern for her welfare, she'll be your friend—your loyal, lifetime customer! That's the way! Gentle pressure, but smooth, you see. And you must have rhythm! One, two, three! Everything is so easy —one, two, three!"

Thousands of women came to rely on the soothing effects of weekly head-and-shoulder massages. Dedicated male customers swore that the tonsorial tonic was an effective cure for baldness. Martha could have increased her fortune considerably by vesting personal interest in Harper beauty parlors. But she never owned more than the original Rochester salon. It was her firm conviction that ownership and management should be one. Her only requirement of fledgling entrepreneurs was that they promise to use the special Harper techniques and products in their shops.

By 1915 she had helped to establish more than 30 former servant girls as independent businesswomen. Her new status as a successful tycoon was reflected in her appearance. The floor-length brown hair was now bound up in a businesslike braided bun, and she wore starched white blouses with trim suit jackets appropriate to a prosperous executive in her late forties. She was respected as the only woman charter member of the Rochester Chamber of Commerce, and her soft voice rang with authoritative confidence.

The carriage-house factory was greatly expanded to supply the growing demands of the thriving chain of salons. A shipping department was added to send the big bars of castile soap, jars of emollient scalp ointment and jugs of the famous tonic to outlets across the nation.

The "founder's salon" in Rochester became a sort of beauty Mecca, to which franchisees flocked for supplementary training in Martha's school of cosmetology. Besides tours of the factory and demonstrations of massage, these gatherings always included long evening sessions of "girl talk" in the Roberts' home, where Martha now lodged as a friend. Her salon-owners became surrogate daughters, who loyally returned her affection.

Several shop owners were on hand to share the late blooming of romance in Martha's life. She treated them to a tour of Yellowstone National Park in 1915, when seeing the geysers meant daring adventure and dusty discomfort in a jolting stagecoach. Drivers were chosen partly for their dashing charm, and 34-year-old Robert A. MacBain was among the most attractive. Mosquitoes, rutted roads and a bandit's holdup of a companion coach did not discourage this young man's attentions to his brown-haired passenger. By the end of the seven-day loop trip of the park, the captivated Martha had persuaded MacBain to come to Rochester to help manage her profitable beauty-treatment business.

The young man from Iowa had done graduate work in law at Columbia and contributed important direction to the Harper chain. But soon after joining the firm, he enlisted to fight in World War I. As a captain, he received five bronze stars, then returned to the

A facsimile of Martha's original little brown jug went to every franchisee for use as a lamp base.

United States in August 1919, and soon went back to Rochester. On October 27, 1920, at the age of 63, Martha Harper married this man who was 24 years her junior, acquiring a handsome young helpmate and a social asset.

The 1920s were years of impressive growth for the beauty business in general. American women came out of the war with the vote, rising hemlines and short hairstyles. The softly curled bob popularized by dancing idol Irene Castle demanded professional care, and thousands of beauty schools sprang up overnight. The infant industry was advanced by the mass manufacture of A. F. Godefroy's hot blast hair dryer and Charles Nestle's complicated permanent wave machine. Despite her new emancipation, the woman of the 1920s was willing to endure the hot misery of up to ten long hours under Nestle's process to achieve a wave that was advertised to "withstand water, shampoo, and all atmospheric influences."

Male barbers tried to enforce old trade laws that seemingly gave them a monopoly on haircutting. In several states female hairdressers were arrested for persisting in their trade.

In the midst of expansion and democratization of a once-exclusive profession, the pioneer Harper salon system could well have been absorbed. Martha's new husband helped to keep this from happening. The Captain, as he was always known, trademarked the Harper name and the company logo, a horn of plenty symbolizing the bounteous financial rewards that would accrue to the servant girl who was wise enough to become a Harperite. With his help the chain of Harper salons was expanded to 500.

Now, instead of traveling by train, Martha was chauffeured in her Captain's new Buick touring car. When she found locations with good potential, MacBain helped her investigate prospective franchisees. "Robbie always looks out for me," she would tell the girls, glancing demurely at her handsome husband. "He's so kind—and such a good businessman!"

Advice to the Harperites

But during the franchise interviews, it was clear that Martha was still the boss. Then the Captain would sit quietly at the sidelines while Martha administered her instant personality test, make her quick decision, and offer her standard lines of encouragement: "I started out with much less than you have, and look what my method has done for me. You can do it too! Your horn of plenty will overflow! You just need drive, imagination and loyalty."

As the decade of the Twenties progressed, Harper salons gradually took on the mechanical trappings of the contemporary beauty parlor. One of MacBain's first Rochester projects had been replacement of the old carriage-house factory with a large brick laboratory on Main Street. In 1921 he hired a cosmetic chemist to expand the Harper products to include every imaginable beauty preparation. Martha insisted that the original tonic remain unchanged, retaining what the catalog called "original ingredients from South America and Dalmatia." New franchisees were each given a lamp-base facsimile of their founder's first jug.

Martha and her Captain opened shops in France, England, Monaco, Cuba, Bermuda, Jamaica and Trinidad. At home they purchased the rambling residence of a former Rochester mayor on a tree-covered acre near the center of the city. When shop owners visited Rochester, they were luxuriously lodged in the MacBains' home. In the morning there was a pancake breakfast, with Captain MacBain ritually wielding the spatula.

At the company's Golden Anniversary in 1938, Martha was 81, her Captain a dapper 57, robust and ready as always to act as a deferential escort and eloquent toastmaster. The affair was a grand one, with the mayor of Rochester and numerous other celebrities

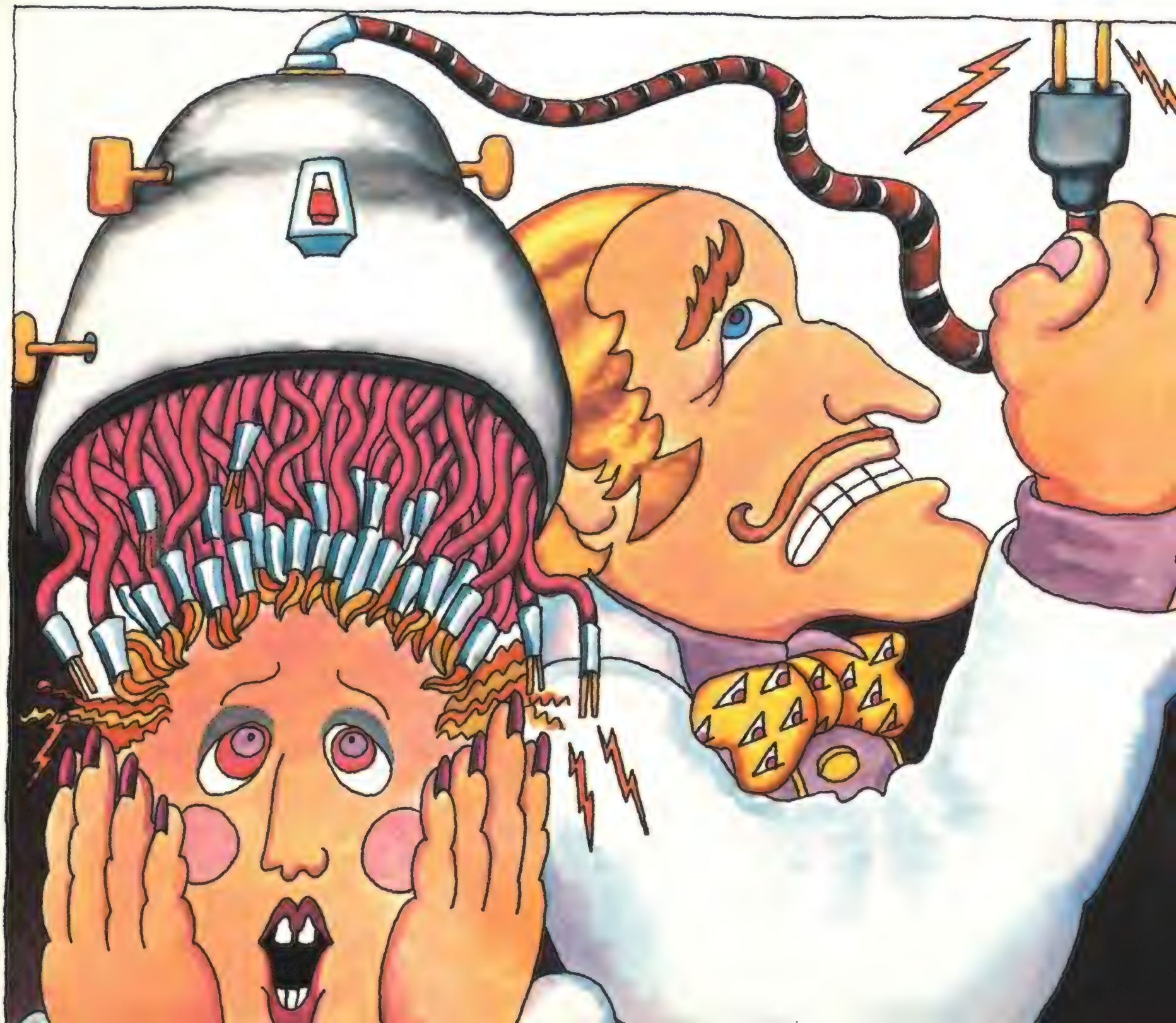
in attendance. Captain MacBain's speech proudly pointed out famous Harper customers—the Marx Brothers, Helen Hayes, Sir Thomas Beecham, Woodrow Wilson, Grace Coolidge, dozens more.

With that grand event, Martha's active control of her empire phased out. One of her nieces moved the founder's salon to a new and fashionable location. A general manager was hired to streamline the business. A standards committee, regular inspections and a stiff franchise fee caused nearly 100 salons to withdraw from the chain. Martha's influence had ended. She died in 1950, active and alert at 93. Captain MacBain retired five years later, and the million-dollar franchise business passed from family hands.

Young beauticians today are vague about the pioneer accomplishments of Martha Matilda Harper. Histories of cosmetology give her little attention. In retailing history there is a shocking neglect of women, and Harper's contribution of franchising receives no mention. Coca-Cola (1899) and Rexall Drug (1903) are most often cited as innovators of the modern small-business franchise system; Martha Harper, who opened her first franchise outlet in 1892, is completely ignored. Yet millions of women all over the world consider their weekly appointments essential.

Martha Harper discerned their human needs more than 80 years ago: "Remember, you want your customer to *enjoy* her experience. Watch her face! If she looks relaxed and lazy, you are a success. But if she's frowning and tense, find out why. Is your massage too vigorous? Is her chair uncomfortable? Does she have troubles on her mind? Ask about her problems! Listen to her and be kind! That's what it's all about, girls! Not just a hairdo, but peace!"

Women of the 1920s endured ten hours under dryers for permanent waves that signaled emancipation.



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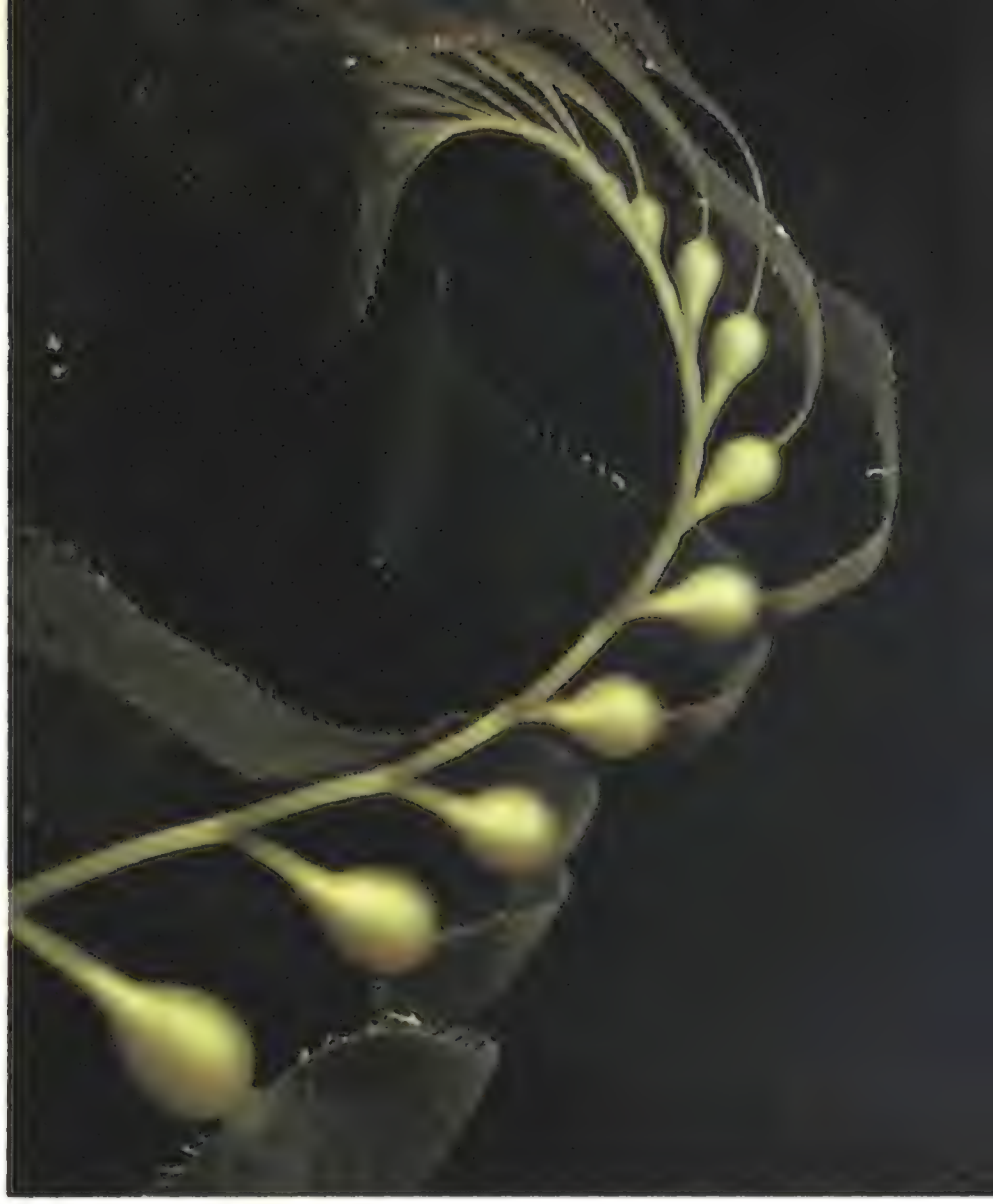
By Timothy G. Branning

Giant kelp: its comeback against urchins, sewage

After a 20-year struggle to perpetuate beds in California, scientists replant them as prime sources of food and energy



A kelp frond swirls in the current, displaying its blades with an air bladder at the base of each.

The morning is chilly. There is a bite in the air, and fog over the bitter blue Pacific has crept inland during the night and left the deck sprinkled with a patina of fine dew. The sun is almost high enough now to make it sparkle.

Emerging from the rear of the 24-foot research vessel *Pyrifera*, owned by the California Institute of Technology, is Dr. Wheeler North. Slapping his hands together to fight off the cold and squinting into the morning glare, he dons his work clothes: wet suit and swim fins, air tanks and regulator.

He prepares for the dive, eager to get below and check the progress of his work. Docked by a week-long storm, he wonders if the surge of storm-driven waves has done much damage. His stomach flutters with an uneasy twinge—bad luck now could mean the destruction of weeks of effort.

Once in the water, he dives for the bottom, 30 feet below. He is pleased with the sight that greets him, hundreds of tiny brown blades clinging tenaciously to the bottom. They are juvenile *Macrocystis pyrifera*, the giant sea kelp that means so much to the waters of the Pacific coast.

Thus North begins another day in a struggle that has been his entire world for the past 20 years. He is an oceanographer, involved in one of three major projects aimed at restoring the decimated kelp beds that once flourished along parts of the coast of Southern and Baja California.

It all began modestly enough, just after the war, when concerned biologists, government and industrial leaders began to notice a decline in the nearly 100 square miles of kelp forest that stretched along the coast. The giant kelp is common in the Southern Hemisphere, but in northern Pacific waters it is limited to certain areas in Canada, the United States and Baja California.

In Southern California, the decline became apparent in the mid 1950s. By 1960 an important six-square-mile bed at Point Loma had been reduced to one-hundredth of a square mile. In other areas, the kelp had become nearly extinct.

That the kelp was disappearing was a serious matter. For one thing, it is the basis of a multimillion-dollar industry. Harvested and treated, kelp yields a miraculous chemical called algin, a substance that helps provide seaweeds the strength and resilience to withstand the strain and swell of wave action. In industry it finds numerous uses in products that require a thickening, emulsifying, stabilizing, suspending gel or film-forming agent. It is the substance that keeps ice cream smooth, suspends pigments in paints and cosmetics, and keeps salad dressing mixed. Algin is used in everything from pharmaceuticals to toothpaste, from cake icings to beer.

But, even more important, kelp is one of the key links needed to maintain the precious chain of ecological balance in Pacific coastal waters. The giant kelp, its strands stretching like primeval fingers toward the surface, is the home of a vast menagerie of aquatic life. Game fish such as the opaleye, perch, kelp bass and croaker thrive there. Crustaceans and bottom dwellers such as the abalone, crab and lobster lurk on the floor of the kelp forest. Thousands of juvenile fish seek shelter in the blades of its canopy.

Supported by hundreds of pneumatocysts (air bladders) that keep the body of the plant afloat, kelp can reach a length of nearly 200 feet. Growing at a rate of up to 18 inches a day under optimal conditions, it is one of the few forms of life that can produce this kind of growth.

North's original involvement with kelp was the result of chance; in 1956 he happened to be one of the few scientists in the area who had taken up the hobby of scuba diving. His diving skills, coupled with his scientific knowledge, made him the perfect choice to undertake an investigation into the kelp's decline.

His first task was to discover the reason for that decline. Several theories were presented, but little scientific evidence existed. Some felt that the problem could be attributed to pollution, others to overharvesting, but no clear-cut answer emerged. The kelp had never been studied extensively, and there was no one to turn to for help. Several years of research left North with only one consistent finding: many of the areas that were once thriving kelp beds were now inhabited by armies of sea urchins. There had to be a connection.

Experiments were begun. The spine-covered purple sea urchins were removed from certain areas around the beds at Palos Verdes, La Jolla and Point Loma, formerly the most important commercial kelp stands on the coast. In nearly every case, the kelp regenerated shortly afterward. The urchins had been preventing colonization by the giant kelp.

Being bottom dwellers, the urchins could not eat upper portions of the plant, but they could gnaw away at the kelp's holdfast, a knotty bunch of fibrous strands that attaches the kelp to the bottom. Once the holdfast is severed, the kelp simply drifts away and is lost to the bed. Not only is that plant lost, but it is big and heavy enough to tear other plants free when it is tossed by wind and waves. North has found that armies of urchins can move through a bed at rates of up to 30 feet a month.

Under normal circumstances, once an urchin population has eaten its way through a bed, it simply moves

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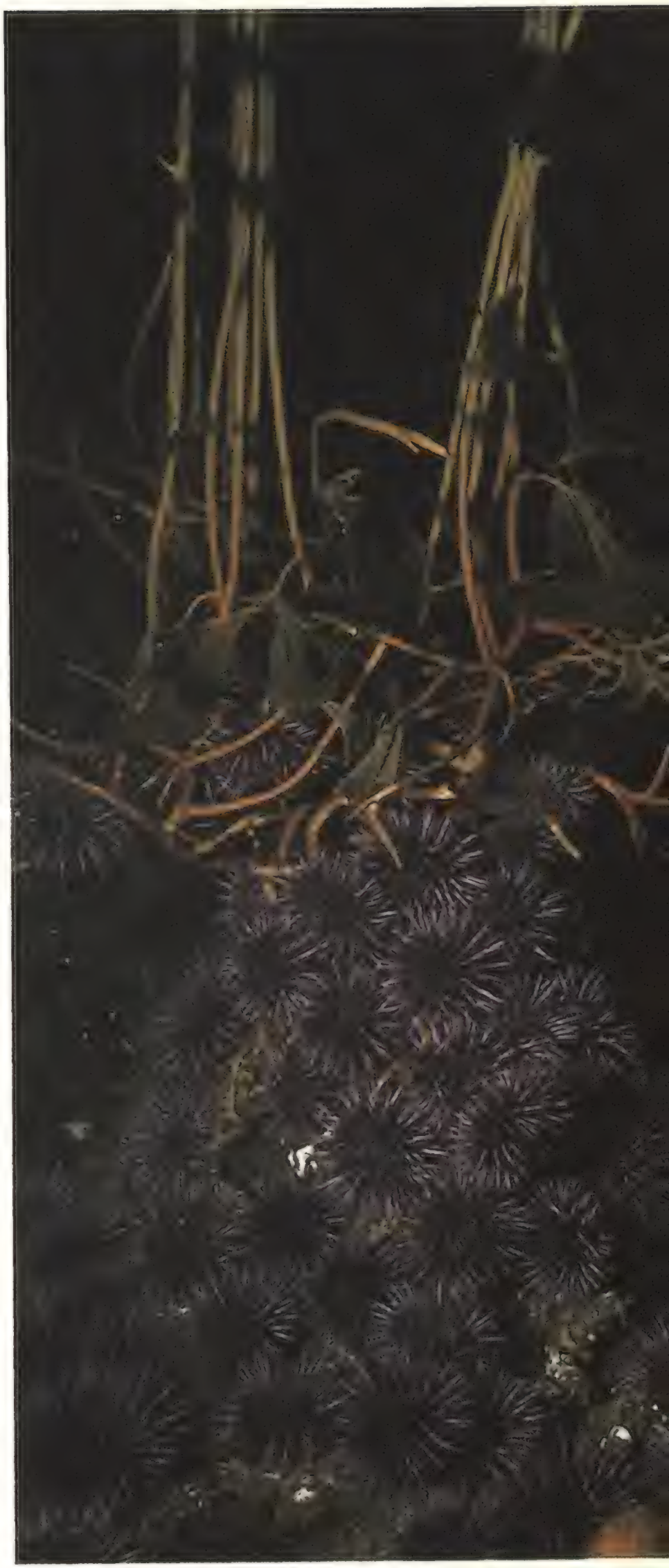


Cluster of sea urchins gnaws on the holdfast that anchors a kelp plant. They may cut it loose.

Kelp makes a comeback

on. Although the bottom is often left completely denuded, kelp spores from nearby beds settle in the area and develop. Thus a cyclical rejuvenation may occur every two to five years. But for some reason, the balance had been thrown out of whack. There were too many urchins and the giant kelp was losing ground rapidly. And the urchins could not be the sole, isolated answer. Kelp beds around Santa Catalina Island survive an even higher density of urchins.

Complicating the situation was the fact that, in 1957, the waters along Southern California began to heat up mysteriously, and continued at temperatures as high as 70 to 72 degrees F for two and a half years. This was much warmer than the normal 52 to 56 degrees, and caused the cold-loving giant kelp to disintegrate, drifting away in bits and chunks with the current. The unfortunate combination of warm water and urchin proliferation created a disastrous situation, resulting in total destruction of some of the beds.

"It was a vexing problem," says North. "Our original task was to find the reason for the kelp's decline. Now we had to discover a remedy. The warm water problem was out of our hands, but the urchins were another matter."

For a time he was stumped. But as luck would have it, North happened to travel to the Monterey Peninsula to do some diving. "It was there that one answer to the entire dilemma fell into place," he recalls. "While diving among a herd of some 50 sea otters, I noticed that the bottom was littered with scores of broken urchin shells. 'Of course,' I thought, 'otters are the most important natural enemy of the sea urchin.' " These otters were the last survivors of herds that had numbered in the thousands along the West Coast. They had been hunted nearly to extinction for their valuable fur, and survived now only because they were protected by law.

But the remaining otters were so few in number that their usefulness in urchin control was limited. It was a sad realization for North, who is particularly fond of the impish little otters. "They are a delight to watch. Their forepaws are extremely dexterous, and they can dive and resurface holding an urchin in one paw and a rock in the other. Floating on their backs, they place the rock on their stomach and smash the urchin against it to get at the meat." Because of their spiny armor, sea urchins are protected from most predators. "But using this method, a healthy otter can eat several large urchins in an hour," says North.

Further research proved that disruption of the otter-urchin-kelp relationship was not the only problem. Earlier, some had suggested that pollution was a factor in the kelp's decline. Indeed this proved to be true, although not in the way originally anticipated.

It was Mary Clark, a colleague of North's, who originally discovered the answer. Her studies indicated that the urchins derived nourishment from the sewage dumped into the sea. In severely polluted waters, the urchins could survive off the sewage as well as the kelp. In these areas, there was no need for them to move on after devouring a bed. Thus the kelp never managed to rejuvenate.

North and his associates began searching for ways to control the urchins. A method would have to be devised for mass removal, for in some areas they completely encrusted the bottom. Finally, David Leighton of the Scripps Institution of Oceanography remembered that quicklime was used on the East Coast to control starfish, a relative of the urchin, in oyster beds. Would the same method work here? Leighton first tried it on a small urchin population in the Mission Bay entrance channel. Vegetation soon reappeared, so they began full-scale testing.

Quarter-acre test

Armed with several hundred-pound sacks of quicklime, the divers set out to sea. In a carefully chosen area, they began dribbling quicklime overboard, directly into the wake of the boat where it would be churned up and broadcast in wide swaths across the ocean floor. Nearly a quarter of an acre was limed in that first trip. The trip was followed by a heavy storm the next morning. The divers were sure that the storm would wash away the quicklime and doom their experiment to failure.

To their surprise, victory was nearly total. The storm-driven waves proved to be a blessing in disguise, for those urchins that were not killed outright by the lime were irritated enough so that they pulled in their suckerlike feet, relinquishing their hold on the bottom. Turbulence caused by the storm had then dashed

One of three boats such as this harvests dense canopy of kelp from beds off the Southern California coast.

them on the rocks, killing almost every urchin in the area. Within a few months, giant kelp spores from nearby beds established themselves, and several fine stands began to flourish.

Pleased with quicklime's effectiveness, they set about liming other areas. Quicklime soon proved to be the ultimate weapon. It was lethal to the urchins, (as well as to starfish and other echinoderms), but it quickly reacted with seawater to form a harmless carbonate. Thanks to its use, the beds at Point Loma near San Diego were 50 percent restored within five years. Eventually, Kelco Company—a San Diego kelp-harvesting firm—hired five divers and assumed urchin control responsibility for Point Loma, La Jolla and adjacent areas.

Eliminating the urchins was not the only problem. In some areas, the kelp had been so completely ravaged that there were not enough plants to reseed the area naturally. Kelp spores can only propagate the species across a few hundred feet; therefore, in areas where no kelp is present, adult plants have to be transplanted to provide the spores that will reestablish the beds. The spores swim by means of two little tails. They attach themselves to the bottom, and proceed to germinate into microscopic, filamentous plants, either male or female. These in turn produce the sperm and eggs that will fuse to become new kelp plants.

Another problem cropped up when some areas were taken over by competitive seaweeds which choked out the young giant kelp plants. During the warm-water years, species of seaweed immune to their effects began to infiltrate the beds. Marine biologist Ron McPeak of Kelco finally devised a method that combined weeding and transplanting into one operation.

New plants on old stumps

One of the more troublesome plants was the palm kelp, a relative of the giant kelp. By cutting the palm kelp's stalk near the base, a truncated stump of three or four inches is left. Young giant kelp plants can then be pried loose from healthy beds and attached to these stumps with rubber bands. Because the holdfast is not a true root (it does not draw nutrients from the soil), detaching it from the bottom does little harm as long as the divers are careful. After transplanting, the holdfast attaches itself to the palm kelp in a matter of three to four weeks. Once the plant begins to grow, it simply envelops the stump and attaches directly to the bottom. Using this method, Kelco has transplanted 28,000 juvenile plants.

With the intercession of Kelco, the CalTech team was free to shift its operation to other areas, most notably the rugged Palos Verdes Peninsula just south of Los Angeles.

Here the kelp problem took on vexing new forms. A sewer outfall near the beds, which dumped 350 million gallons of sewage into the water daily, had provided the sea urchins with a virtual paradise. In addition, the sewage clouded the water and decreased the light penetration significantly. Because kelp, like most plants, employs photosynthesis to convert the sun's energy into growth, it could no longer survive in the deeper levels of its range. Giant kelp grows best in waters between 15 and 60 feet, although some plants have been found at depths of 100 feet. The cumulative result was that the beds at Palos Verdes, which once covered three square miles, became nearly extinct. A survey in 1968 revealed only two adult plants in the area. North realized that mass transplanting would have to be undertaken.

Beginning in 1969, the team began transplanting giant kelp from Newport Beach to the south into Abalone Cove at Palos Verdes, lashing it to small buoys distributed along thousands of feet of scrap chain.

In 1971, the Palos Verdes project received a big boost when the California Department of Fish and Game assigned three divers and a boat to undertake additional transplantings. They began collecting plants from Catalina Island, 27 miles off the coast. Catalina was far enough away from the mainland to be free of most coastal pollution, and several fine stands of kelp still flourish there.

The Department of Fish and Game took a slightly

different approach by transplanting smaller adults, ranging up to 30 feet in length. It was their reasoning that the smaller plants would have a better survival rate and might be less hampered by grazing fish.

Fish and game marine biologists Ken Wilson, Pete Haaker and Doyle Hanan also adopted the transplanting method developed by North. They suspended the kelp a few feet above the bottom on floats attached to surplus Navy anchor chain laid across the ocean floor. The idea was to keep the plants up off the bottom and away from urchins.

Using this method, fish and game biologists have transplanted some 5,000 mature plants to four areas along the peninsula, and plan to expand their operations. Natural reseeding from these adults has been very successful, and the bed at Abalone Cove expanded from one-tenth of an acre in June 1974 to 21.5 acres in January 1976. Another bed at Point Vicente grew from zero to 1.08 acres in one year.

According to Ken Wilson, "The Palos Verdes kelp is doing well, and the beds are beginning to draw game fish. The importance of giant kelp as a fish habitat cannot be underestimated. It is estimated that a rocky bottom can support about 100 pounds of fish per acre, but the same area covered with kelp can support three times as much.

"The kelp not only attracts many smaller animals which serve as food, but also provides a much greater vertical depth where fish can hide and live. Open water is not the ideal habitat for many species." The projects at Palos Verdes have now restored the beds to about one percent of their original size, and work there continues all the time.

Now the CalTech biologists have begun turning their attention toward other aspects of kelp cultivation. Transplanting mature plants has long been considered a slow and tedious process, and so the question was posed: would it be possible to cultivate kelp spores from healthy plants and then sow them mechanically?

Study revealed that it was, and soon CalTech's laboratories were turned into the world's first giant-kelp nursery. Spore culturing proved to be fairly complex procedure.

First, kelp spores are collected from the spore-producing blades (sporophylls) near the base of mature plants. Under optimal conditions, these sporophylls release millions of spores per square centimeter.

Once liberated, the spores are exposed to a long plastic sheet, and stored in an aquarium until they attach. Once attached, the spores cover the sheet with what appears to be a slight film of brown algae, actually the microscopic filament stage in the life cycle. These are tiny kelp plants, so small that a square centimeter contains up to a million of them.

At this point the plastic sheets are stretched out in long troughs with cold circulating seawater. Within a few weeks, the plants are mature enough to be scraped loose and broadcast into the sea.

Survival rate for the young kelp is only about one in 100,000. "A wheat farmer would go broke fighting

Six- to eight-week-old kelp plants grown on plastic ring, ¾ of an inch across, held by a clothespin.

those odds," says North. "But the embyros are so plentiful, we can produce about ten billion plants each week."

Another culturing system employs thousands of three-quarter-inch plastic rings. Spores are allowed to settle directly onto these rings. After several months of care, the rings are attached directly to the ocean floor. This eliminates scraping, thus insuring a much greater survival rate. Restoration employing these methods and transplanting has enjoyed such success that North and his associates are now experimenting with new ways to use giant kelp commercially.

Food is one possible use. We may someday grow kelp for both human and animal consumption. Kelp and other seaweeds are already harvested and eaten in a number of countries, and studies going back to the First World War have shown that it is an excellent supplement to cattle feed.

In his definitive book, *Seaweeds and their Uses*, New Zealand botanist V. J. Chapman lists 20 species of algal seaweed currently eaten outside the Orient, in Europe, North America and Chile. In Nova Scotia and New Brunswick alone, as much as 725,000 pounds (dry weight) of a red alga known as dulse are harvested each year.

A few weeks later the plants are about two inches long. Soon the rings will be attached to the sea floor.

Ron McPeak, a kelp company diver, pries a young plant loose for transplanting in another area.

Some 22 species are used in China, some since at least the sixth century B.C., but the Chinese now import more from Japan than they harvest themselves. The Japanese are the top seaweed consumers.

Although principally composed of carbohydrates, seaweeds are good sources of iodine (which prevents goiter) and vitamins A, B_2 and B_{12} and C. A quarter-pound serving of dulse also supplies more than half of the adult daily requirement of 66 grams of protein.

The same nutritional qualities made seaweed a candidate for animal feed. Animals still feed regularly on fresh seaweed in Iceland, Scotland, Norway and France; seaweed meal has been used as a feed supplement in the United States for at least the last 40 years.

Seaweed has been used as a manure in France since the 12th century and in England since the 16th. Today gardening magazines carry pages of advertisements for seaweed concentrates, and agricultural scientists are studying their possible role in resisting insect pests. Seaweed is about the equal of farm manure in nitrogen content, weaker in phosphate, but superior in potash. (Both are weak fertilizers: a ton of farm manure or seaweed contains only about 11 pounds of nitrogen.)

According to Howard Wilcox, head of the Navy's Ocean Food and Energy Farm Project in San Diego, "Giant kelp has great potential as a source of food and energy. Its tremendous growth rate, and the fact that it can be cultivated without utilizing our dwindling supplies of farmland, make it very appealing."

The Navy is working on the energy angle, studying

a method whereby harvested kelp can be converted into methane gas. Methanogenic bacteria are introduced into large digestion vats filled with kelp. As the bacteria consume the kelp and break it down, they produce a waste product—methane. This same phenomenon occurs naturally in swamps when large masses of decaying matter are converted into methane or "swamp gas."

According to Wilcox, the method can be 90 percent effective. That is, the energy produced by burning the methane is 90 percent of the energy produced by drying the kelp and burning it directly. "But we don't plan to carry it that far because it takes 20 to 30 days to reach 90 percent efficiency. In four or five days we can achieve a 50 percent efficiency and still be left with a highly valuable residue sludge for commercial sale. Because of its high nitrogen content, the kelp sludge should make excellent fertilizer. It can also be converted into cattle fodder, human foods, and of course, the many uses of algin."

Wilcox estimates that 300 pounds of wet kelp can produce three pounds of methane. "This is an economical method of producing energy," he says. "But it cannot yet compete economically with gas derived from mining or drilling at this time. As our natural supplies of energy continue to dwindle, this source will take on new significance."

Unfortunately for the Navy plan, however, kelp grows only in a few patches along the West Coast; to be of significant value in the future, it will have to be grown in much larger quantities.

The Navy and CalTech have devised a method, using subsurface platforms, to establish deep-water plantations off the coast. By attaching floating grids to the bottom, artificial "reefs" can be created. Suspending the grids about 40 feet below the surface provides the kelp with a habitat similar to coastal waters. But because the nutrients needed to support kelp occur primarily below 100 feet, engineers have had to design a simple pumping system whereby nutrient-rich deep water can be brought to the surface. The cooler deep water also helps combat the problems associated with periodic influxes of warm surface water.

Wilcox says that a one-square-mile marine farm of this type is conservatively projected to yield enough food to feed 3,000 to 5,000 people. At the same time, such an area could produce enough energy and by-products to support the needs of 300 persons at today's consumption levels.

The Navy was to start its testing with a quarter-acre test module to be moored 60 feet below the surface in 2,100 feet of water about six miles southwest of Corona Del Mar, California. If it succeeds a thousand-acre module will then be tested for four or five years. Phase three, a 100,000-acre module costing $2 to $4 billion, could be in service by 1992.

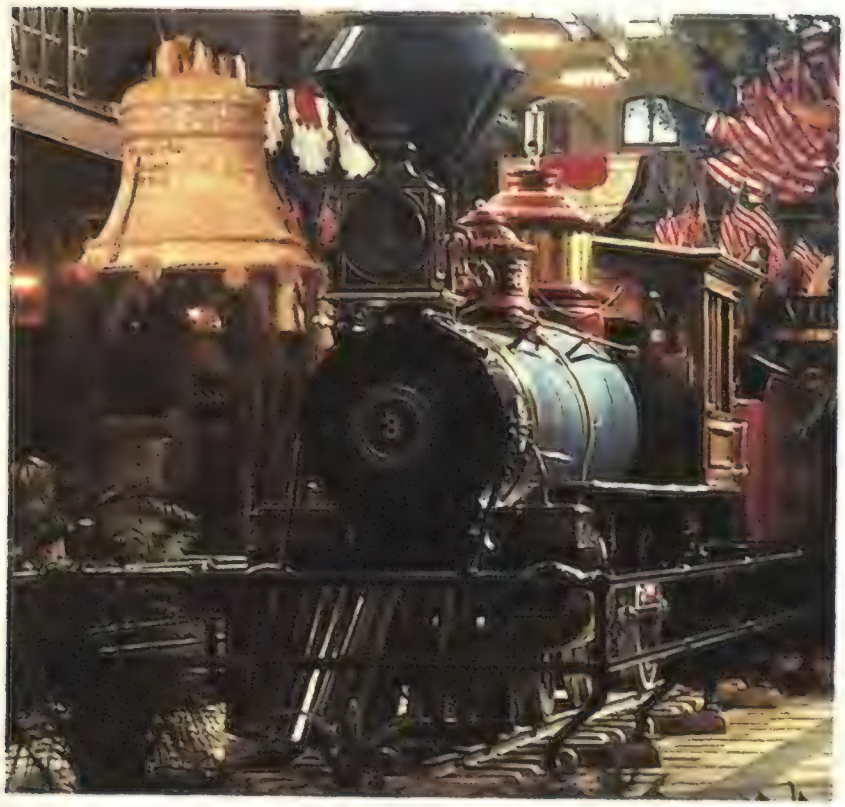
Despite all these advances in kelp culture, the original goal of reestablishing the beds along the coast remains a prime concern—and a constant battle. "If the efforts at Palos Verdes were abandoned," explains North, "the beds would probably disappear within a few years. Without aid, the San Diego beds would continue for an indefinite period, but would be greatly reduced over the years. It is simply impossible to regain pure ecological balance. Without sea otters, the coast will never be returned to its original state."

Ken Wilson agrees, "Man is now an integral part of the ecosystem and his influence upon it cannot be discounted. We have been fighting an inshore battle to save the giant kelp for many years, and yet this is only a small part of the overall picture. Some people, for instance, have advocated transporting otters back into Southern California to combat the urchins, but they never give a thought to what this would do to the fishing industry. Otters are voracious eaters. They can eat 25 percent of their body weight every day, and they certainly don't limit themselves to urchins. In any given area, a colony of otters will eat abalone, crabs, clams, lobster and other creatures all of direct commercial or sport importance. It's a delicate and complicated situation, with no easy answers."

And so the struggle to keep the giant kelp growing continues. It is a struggle that will never be over, whether in the kelp's natural habitat or new artificial homes. But in the process, some semblance of order can be restored to the troubled waters off the coast of Southern California.

Truly a marine forest, a giant kelp bed is home to myriad species of fish and invertebrates.

While "1876" fountain plays, sightseers stand beneath the orchestrion to hear music.



Santa Cruz Railroad locomotive, built in 1876, pleases steam buffs. Liberty Bell is of wheat.

Photographs by Robert Lautman

Newest museums are in full swing

Two Smithsonian buildings on Washington's Mall—one new, one old but with new purpose—delight the season's Bicentennial visitors

The contrast between the Institution's new additions could hardly be greater. "1876" fills the old Arts and Industries Building with the substance and sensations of a century ago. It hems in the viewer with such hedgerows of fascinating memorabilia that he seems enmeshed in memory. On the other hand, the National Air and Space Museum, just down the Mall, lures the viewer into a vast block of open space and confronts him on a one-to-one basis with displays that powerfully testify to modern achievements and hopes.

Superlatives abound in the new building. It is, for example, undeniably the first one to be opened by a signal transmitted from a spacecraft near Mars. Its 23 exhibit areas contain the world's most remarkable collection of significant air- and spacecraft.

The design, which has won an award for the architectural firm of Hellmuth, Obata and Kassabaum, is supposed to allow close inspection of displays without crowding, but so great has been the public response that few of the exhibit areas have much elbow-room.

"1876," the other newest museum—or rather a nostalgic modern use for an old museum building—is another unqualified success. At ten every morning its doors open and visitors rush inside, only to slow in wonder at the wealth of displays—silver- and chinaware, inlaid furniture, steam engines and Gatling guns. They are photographed by an 1876 camera and they walk among the live plants to the fountain where they listen to the orchestrion playing everything from Wagner and Offenbach to *Dixie*.

Behind visitors in the Air and Space Museum's Milestones of Flight gallery, a mannequin depicts Astronaut Edward H. White setting out on Man's first spacewalk from Gemini IV.

Karl Ort of Pennsylvania, who flew warplanes of 1918, stands before an exhibit of World War I.

Architect Gyo Obata, whose design won award, jokes with Air and Space Director Collins.

Suspended fighter plane seems to be joining the attack on a B-17 squadron in mural in the World War II gallery. Artist Keith Ferris painted actual event in mission over Germany.

In Space Hall, visitors line up to enter the Sky Lab Workshop with its rectanglar solar panel. Early rockets hang over balcony, facing today's giants rising roofward at right.

In the centuries-old tradition of scarecrows, a new one makes good use of whatever came to hand including a paper bag adorned with a face and tied in place with a clothesline cravat.

By Avon Neal

Scarecrows provide an antic art form

Straw-faced, stick-armed effigies still fight farmer's unceasing battle against pests, using his old clothes and his wife's talent

Spectacles on this straw man provide a glitter that supposedly drives off marauding crows.

Somewhere in the annals of American folklore there is a tale about the farmer who made a scarecrow so fearsome in appearance that crows not only left his crops alone but brought back corn they had stolen years before. It is the kind of story that appeals to those who wage continuous battle against not only crows but other garden pests as well.

From Man's earliest efforts to protect his crops he has relied upon scarecrows. Created in his own image and more often than not dressed in his own cast-off clothing, these intimidating minions stand guard while he is attending to other chores. They range from simple stick figures draped with old gunny sacks to elaborate sartorial masterpieces, some of them fit for display in a museum.

There is evidence to show that when Columbus set foot on this continent, Indians were using scarecrows to keep vigil over their cornfields. The Colonists used them extensively as they heeded the planter's adage and dropped five kernels into each hill of corn, "one for the woodchuck, one for the crow, one for the cutworm and two to grow."

Stories abound about tramps who have replenished their wardrobes at the expense of scarecrows. During the late Victorian era it was not unusual for a field effigy to spring full-blown from last year's outmoded Sunday best, and it was the lucky vagabond who plundered him. A present-day tramp, however, would be hard put to come away with anything wearable from some of our contemporary scarecrows which, more than likely, consist of spin-offs from modern technology—strips of metal foil, garish reflectors, tin cans, plastic doodads, glass baubles, aluminum pie tins, and all things that flash and glitter in the sunlight or jangle as they clink together at the slightest breeze, supposedly to the terror of crows.

In former times when scarecrows were meant to be more utilitarian than ornamental, most were erected plain and practical. A ragged black coat flapping in the wind was enough to keep crows at bay, and a sweaty work shirt hung over a fence post discouraged the nocturnal forays of deer. Because of Man's inherent desire to decorate, scarecrows finally have evolved into the quaint field figures that populate our countrysides today.

It is remarkable how many scarecrows end up looking like the people who made them. This phenomenon has often been sheepishly noted by passersby who have hailed a friend from a distance, only to learn upon pulling alongside that they were addressing a newly constructed scarecrow. More than one hill-country feud has been avoided when closer scrutiny revealed that the supposed slight of an unreciprocated "Howdy, neighbor" came from a stoic scarecrow instead of a peevish farmer.

Photographs by Ann Parker

Scarecrow with sternly featured tin bucket head stands stalwart guard over a farm cornfield.

Carmen Miranda hat provides a receptacle for litter in this upper New York state garden.

Masked effigy was created by Yugoslav immigrant for fun as well as for effect.

Such resemblances are no doubt coincidental, owing to the maker's having used his own discarded garments. A portly farmer may hang a ragged coat and a pair of triple-patched overalls on a post and stuff them with straw until their seams split and their buttons pop; a skinny person sticks a sparsely clothed, Slim Jim figure in his field.

A woman in Massachusetts used her deceased husband's old clothes to construct a scarecrow for her vegetable patch. After a few days, however, she removed it, explaining that it was most disconcerting when she passed her kitchen window and caught a fleeting glimpse of it out of the corner of her eye; the familiar slouch and loose garments flapping in the breeze reminded her too much of her late spouse striding through the corn.

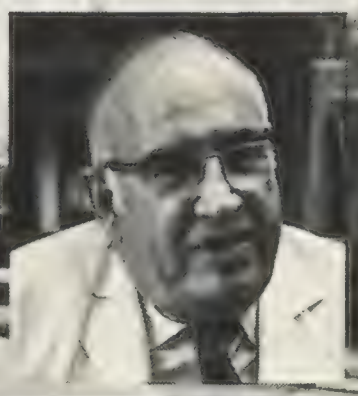
Crows are getting bolder

Although farm folk have tried all sorts of devices to trick crows, they still face the same problems as did their pioneering forebears. Only now, in this age of automobiles and other mechanical contrivances, crows seem much bolder for they are no longer terrified by sudden blasts of noise or flashes of light. In spite of all the racket-makers, bright flashers, clanging pan lids, whirligigs, dangling metal strips that tinkle and clatter in the breeze, decoy owls, waving streamers, explosive fireworks, obnoxious scents, alarms and electronic gadgets that go off at irregular intervals, and other Rube Goldberg contraptions employed to drive them off, wildlife of one kind or another continue to exact their annual tribute from farms, just as they have since tilling of the soil began.

It is interesting to note that women turn their creative talents to the art of scarecrow construction as often as do men, although the majority of their creations are male. Children are the most spontaneous, while summer folk contribute more in the way of decoration. Many of the finest scarecrows are built by immigrants from Europe, generally older people of peasant stock who brought the tradition with them from Germany, France, Italy, Portugal, Poland, or other countries steeped in this rural custom. They take great pleasure in planting their rude mannequins in just the right places in their vegetable gardens and in arranging with meticulous care every detail of dress for their effigies.

There is no end to the reasoning people use to justify their scarecrows; some are defensive, others good-natured and indulgent when asked. Most bestow affectionate titles on them, names like The Duke, Slim Jim, Skinny Minnie, and in one case a lady, herself a summer refugee from city life and, no doubt, fashionable hairdressers, christened her outrageously frazzle-

Doctor Arnold Arms believes the air bag saved his life.



Arnold Arms, M.D.
Kansas City, Missouri

Dr. Arms' 1975 Oldsmobile after head-on collision with a bus. He described his injuries as "minor." Dr. Arms was not wearing a seat belt, but his car was equipped with air bags. (See arrow.)

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"I did have a ligamental strain on the knee and I had a hematoma (bruise) on the inner side of my leg below the knee joint. I felt comfortable otherwise . . . and was able to look at a passenger who was in the bus and make sure that she was safe.

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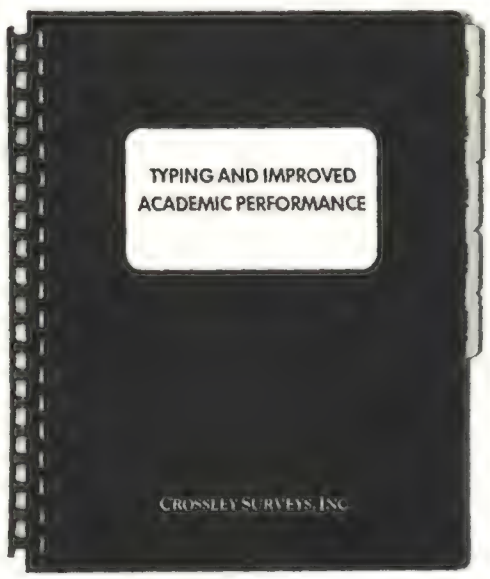

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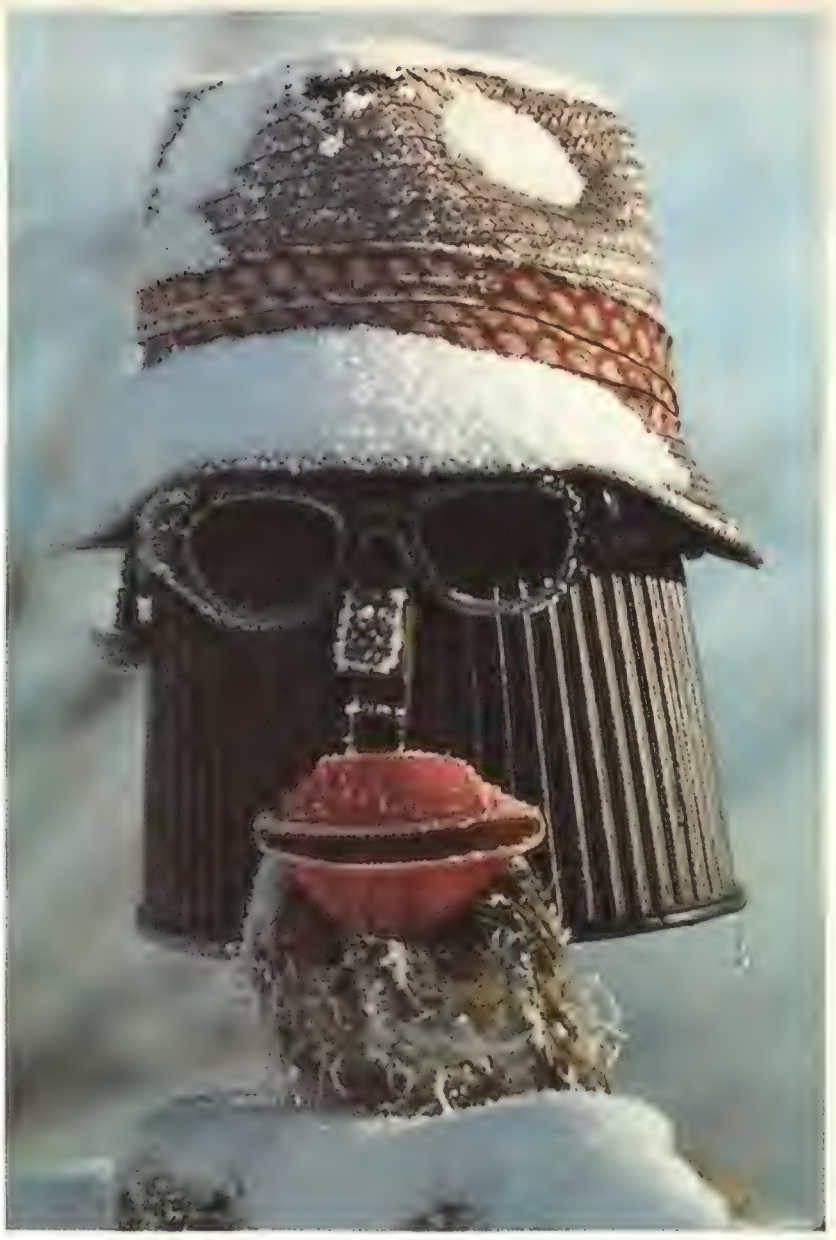
topped garden figure Gorgeous Gussie. A rather dour upstate New Yorker simply gave his creation the grim sobriquet "It."

A housewife in southern Connecticut insists upon filling her garden each year with whimsical figures and rearranging them every few days because, as she explains it, woodchucks cause her the most trouble and "they don't like it when things get changed about."

Another woman, an elderly Vermonter, claimed that the bedraggled scarecrow in her tiny, well-kept garden was "just plain useless when it comes to scaring off crows and other critters," but she liked it because "the poor old thing is such good company."

Scarecrows are ephemeral creatures, rarely lasting beyond their season in the sun. Most often they land on the rubbish heap, entwined in garlands of withered squash vines or stacked with the bean poles beside a garden wall. The skeleton may be broken into lengths to warm the hearth some frosty evening when the harvest is in.

It is safe to say that practical people don't put much faith in scarecrows. That all-too-familiar scene of crows perched on the outstretched arms of a guardian of crops belies any notion of infallibility. Nevertheless, scarecrows continue to be the nostalgic quintessence of rural life.



Snow drapes a nattily straw-hatted scarecrow that seems ready for a Caribbean cruise.

With braided rug shawl and tattered umbrella, this effigy is topped off with a fake crow.

Photographs and text by Laurence Pringle

Foraging for food provides rewards for a brave palate

The ultimate in natural foods is gathered as our ancestors did from stream, field and woods, where the seasons set the menu

Sing a song of sixpence, a pocket full of rye;
Four and twenty blackbirds baked in a pie.
When the pie was opened, the birds began to sing;
Was that not a dainty dish, to set before a king?

Yes, it was a great dish, according to Christopher Letts, a wild-foods expert, naturalist, stonemason and sometime commercial fisherman from Michigan. He changed the recipe somewhat. In North America, blackbirds are legally protected from becoming pie fillings. But starlings, birds that are black in color and reputation if not in name, are unprotected and considered by most people to be alien pests. A flock of starlings was emptying Letts' bird feeder as fast as he could fill it one winter. He began shooting them and cutting the breast muscles away from their sternums.

"There's not much meat on a starling," Letts admits. "You end up with two pieces of meat about the size of a man's thumb. Four and twenty birds didn't look like enough, so I eventually used about 30 starlings. Then I just followed a chicken pie recipe, invited some friends over, and, by God, it was delicious—a bit like veal, or perhaps coot. *Good*, anyway. Starlings are bugging people all over the United States, and they could be a tremendous source of food. Let's turn them into pies! Make that nursery rhyme come true!"

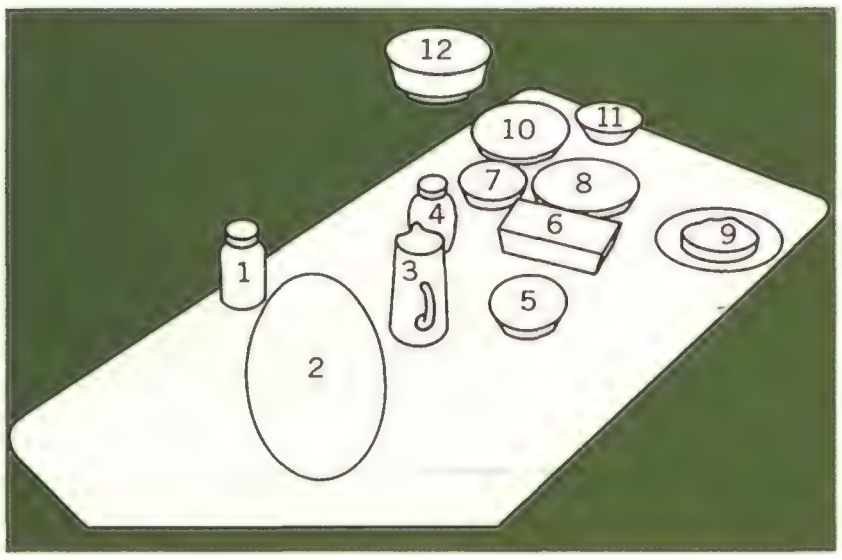
His tongue may have been in his cheek, but Letts is unabashedly enthusiastic about food in general and wild foods in particular. Like thousands of others, he has eaten wild asparagus and dandelion greens. But he has also eaten crow, chipmunk, goldfish, mud puppy and rattlesnake. And he's willing to try Norway or any rat, provided that it is a cornfed farm animal and not a city dump denizen.

Say "wild-foods expert" and most people respond "Euell Gibbons." Letts has nothing but praise for the late wild-food popularizer, and urges people to read his books, especially *Stalking the Wild Asparagus* and *Stalking the Blue-Eyed Scallop*. "His books are full of sound, *tested* information, and his dissertation on wild strawberries is poetry, in my opinion."

But as Gibbons himself pointed out, there are many wild-foods experts, and the field of wild-food foraging and cuisine is wide open to experimentation and innovation. Letts is one of those with an open mind.

He says, "I never follow a wild-food recipe from any source more than once; then I start changing. I think that anyone who is interested enough in foods to want to experiment with new tastes and especially with wild foods is probably also an innovator in the kitchen, and is going to add this, or withhold that, or change cooking times, and come up with results that please them more than what they get from following a recipe."

If Letts has a specialization, it is gathering complete



This dinner of wild foods was put together by Chris Letts (p. 123) in the Hudson Valley, drawing on the fruits of the river as well as the fields. The key at left identifies the dishes. By the numbers they are: 1, pickled shad; 2, blue gills and brown trout; 3, birch beer; 4, pickled crabapples; 5, snapping turtle; 6, shad roe; 7, herring roe dip; 8, knotweed pie; 9, herb bread; 10, raspberry pie; 11, smoked herring dip; and 12, poke in hollandaise sauce. Hidden from view is a salad made of lamb's-quarters, sheep sorrel, cattail—and some very unwild lettuce and tomatoes. The reaction of the younger diners to some of the more exotic dishes was not recorded.

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meals, including animal protein. "Many foraging books and foragers," he says, "stress a taste of this, a taste of that. They stay away from the meat dishes, the entrees. That's fine, but it's hard to live on wild onions or catnip tea. I'm more interested in full meals. I rarely buy meat for myself, but I eat very well on rabbit, pigeon, fish, snapping turtle, crayfish, frog legs and muskrat."

This is not everyone's cup of sassafras tea. It involves fishing, hunting and trapping; knowledge of state laws which regulate these activities; and direct involvement in the death of animals for their flesh—an activity which many people abhor, though usually not to the point of giving up meat. Partly for this reason, Letts emphasizes plant foods when he leads foraging hikes. Participants return with buckets and plastic bags overflowing with vegetables and fruit, and minds full of ideas and recipes.

No encouragement

He is often asked how and when he became interested in "living off the land." Gibbons credited the influence of his mother and grandmother, both of whom were active foragers in the rural Southwest where he was raised. Lett's experience is the opposite: his interest in wild foods was not encouraged by either relatives or surroundings.

"I remember pretending to cook in clam shells when I was a little boy; somehow the interest was there early," he recalls. "But I was stuck in a suburb of Detroit. There was little green around, and no one knew anything or *wanted* to know anything about foraging or the outdoors or survival skills. Many of the people in the neighborhood, including my parents, were just one generation off the farm. They didn't want to have anything to do with the land, except for some gardening.

"Some of the nicest family experiences I remember were the rare occasions we went berry-picking or nut-gathering in the country. I didn't realize that there were experts on living off the land, that there were books written on the subject."

Along about the time he was 14, Letts started to experiment on his own. Fishing one cold autumn afternoon, he fell into a stream, and was waist deep in icy water. Then he saw some crayfish at his feet. He recalls thinking, "I might as well get something out of this," and filled the pockets of his fishing vest with crayfish. To his parents' dismay, he brought them home, dropped them in boiling water, cracked open the tails, and ate the meat inside. Today, crayfish au gratin is one of his favorite foods, though he also serves crayfish casseroles, cakes and salads.

His interest in wild foods intensified during later teen-age summers, when he was a staff naturalist at a Boy Scout camp in the Detroit area. There he learned to recognize a dozen or so edible wild plants, and sometimes ate them. Mostly he was pleased just to talk about them, and to think that they *could* be eaten.

His stay at the camp had another important effect, however. Until then the prospect of working most of his life had seemed grim; now he was being paid for doing something he enjoyed. One summer he read Robert Frost's "Two Tramps in Mud Time." An idea in the poem—"My object in living is to unite/My avocation and my vocation/As my two eyes make one in sight"—became Letts' ideal. And so far he has lived it, with a strong earth thread running through his life.

In 1960 he was in the Navy and in Alaska. His face brightens when he mentions Alaska. It was there that he first experienced the joy of gathering a meal of wild food, then cooking and eating it right on the spot. "On Kodiak Island in the summertime you can't starve unless you have lockjaw. At times I would stand in a stream, take off my hat, and claw ripe salmonberries off bushes. They are like red raspberries, only bigger. The hat

Meat, here a fresh snapping turtle, can be part of a forager's menu.

Chris Letts examines a stand of poke. Only young sprouts should be eaten.

would be filled to the brim in a minute.

"Then, from the same place, I dropped a fly on the surface of the stream and caught a trout. Wading ashore, I came to a nice stand of rice root. I pulled up some of that and rinsed it in the stream. And that was that—fruit, vegetable, meat—a complete dinner!"

There is something special about cooking and eating "on the spot." The food is extraordinarily fresh, of course, but there's something else too—a feeling of closeness, of unity with nature, of being directly connected to the land and water. The connection is there for everyone, of course, but most of us lose any sense of it after years of shopping in supermarkets.

Recently Letts and some friends dined "on the spot" in Florida. When the tide was low (which happened to be at 3:30 A.M.), they seined for shrimp. The catch was dropped into a pot of boiling water, and the party had a feast of shrimp, Cuban bread and wine—just 20 feet from where the shrimp were netted.

Some of Letts' knowledge of edible wild foods came to him via strange routes. With the Navy in Cuba at Guantanamo Bay, one day he was reading John Steinbeck's *Cannery Row*. The novel described a character who lived on the beach, and who ate sea urchins—raw. Letts immediately put the book down, pulled on tennis shoes, and waded into the water. "I tapped a couple of sea urchins with my toe and they broke open. Inside was a yellow substance—the roe

Laurence Pringle, who has written about coyotes and wild rivers for SMITHSONIAN, *lives near the Hudson.*

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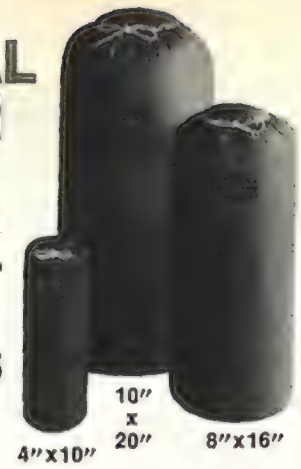

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or sperm sacs. I hesitated, wondering whether I really wanted to eat that. Then I tasted a little bit, and found it was delicious."

After discharge from the Navy, Letts earned a bachelor's degree in biology at Central Michigan University, where he also obtained a master's degree in outdoor recreation and field biology. His "earth thread" has run strong ever since, whether as a nature center director or commercial shad fisherman on unpolluted parts of the Hudson. And taking food from his natural surroundings has become part of his lifestyle, sometimes out of economic necessity, but always with curiosity and delight at the riches he finds.

Increasing numbers of people are edging into the world of wild foods, reading Euell Gibbons' books, taking courses at botanical gardens and nature centers. Foraging for wild foods often makes economic sense. The tender young leaves of a plant called poke, for instance, have a flavor that is frequently compared with asparagus, and poke is widespread, abundant and free. For some the naturalness itself is an attraction. Wild foods have not been bred for such characteristics as machine harvestability.

Letts has inspired scores of people to begin foraging. He says, "Just a few years ago I knew less about plants than the average gardener; if I can do it, anyone can. Foraging is a great way to spend a day, or part of one. You're outdoors—col-

Staghorn sumac, source of a beverage. Poison sumac has gray, white fruit.

lecting, tasting, smelling, appreciating. You come back with all sorts of rewards: suntan, exercised muscles, a good appetite, and something to take care of that. In most of North America, during a large part of the growing season, a half-day afield should result in at least a very satisfying three- or four-course meal for the whole family. Certainly a grand salad."

He warns that foraging may be slow at first, unless one is already a "shirttail naturalist." (Caution is crucially important; a mistake can make you very sick and even kill you. Euell Gibbons once wrote: "My rule is: *Never use any wild plant or creature for food until you have identified it and know it to be edible.*")

Identifying the plants may be difficult for a while. The illustrations in some foraging books are more decorative than useful, and other plant identification books may be needed. The little paperback "Golden Guide" *Weeds,* by Alexander C. Martin, is especially useful, because many nutritious and delicious wild plants are often considered to be nuisances. With a grimace, Letts remembers, "For many years I weeded my parents' garden and threw away purslane and lamb's-quarters—food as good as any we grew. This past spring, as I turned the soil in my own garden, getting ready to plant vegetables, I also harvested a nice crop of so-called weeds—dandelions, plantain, milkweed sprouts, lamb's-quarters."

Consumer ecology

Often the habitat in which a plant grows is a clue to its identification. Cattail, for example, is a shoreline plant of ponds, marshes and slow-flowing streams. It is also widespread and one of the most versatile of all edible wild plants. Many others are pioneer species, the first to invade the disturbed soil of construction sites, or the seemingly inhospitable soil of school playgrounds, city backyards, the strips between sidewalk and street, fencelines, railroad tracks, roadsides and corners where lawnmowers don't reach. Euell Gibbons has described meals harvested from Manhattan's Central Park and from a street median in downtown San Francisco.

A forager learns to adjust to the seasonal flow of nature. The succulent young stems of Japanese knotweed, for example, are available for only a week or two. In that period you can easily

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Foraging for food

pick a bushel of this plant in just a few minutes. But if you are a little late, ordinarily your next chance for the delights of knotweed is a year away. (New shoots will be produced, however, if you cut back the mature stems. The same is true of poke.)

"Before long you get into the natural progression of growing things," says Letts. "When the knotweed is too mature, you also know that morel mushrooms are probably finished for the year. But it is time for something else—perhaps elderblows, the flower clusters of elderberry, which can be made into fritters or a rather nice wine.

"As you forage for hickory nuts in the fall, you may notice a thicket of sassafras —a source of tea and jelly. So you file the information in your cerebral Cardex. Do the same with those blackberry canes that scratch your legs on an autumn mushroom hunt, or with those stark white dead poke stalks. From clues like these you can learn the sources of what will be next year's feasts."

After a while, foraging can be as reliable as a stop at a supermarket. It can be fast and efficient, though these words may seem to be the antithesis of foraging. But it *is* rewarding to get enough wild food to give to friends, to feed party guests, to freeze, can, dry or smoke enough for dozens of meals in the off season.

Letts feels sorry for people who just hunt or fish or hike or photograph or watch birds, and who do *only* that. "They miss so much. You can forage while doing all sorts of other things outdoors. You can forage while riding in a car; I can spot elderberry at 60 miles per hour. But bicycling is one of the best ways. You see so much. It's easy to stop, get off, walk over, and collect what you want."

Some for next year

Foragers are usually not greedy, though they are remarkably closemouthed about the location of their favorite "wild gardens." They know better than to wipe out a stand of edible plants, and not just because they anticipate next year's crop. "I've left perfect mushrooms in perfect settings," says Letts, "just as Robert Frost's early morning reaper, in 'The Tuft of Flowers,' left a patch of flowers in a hayfield, simply because it was beau-

Mayapples like this can be used to make jelly, jam or marmalade.

tiful. I've also left the perfect trout in the perfect pool, even though it easily could have been caught.

"I don't see everything with the eyes of a cook. The beauty of a morel mushroom is not lost to me just because I love to eat morel mushrooms. I still enjoy the flight of a flock of pigeons, the way they move almost as a unit, even though I also enjoy them stuffed with mushrooms and wild rice. I don't feel that I've lost anything by becoming a forager, by making it my life-style."

A wild foods sampler

Christopher Letts offers these tips for people who want to sample some wild foods. The photographs will aid identification, as will foraging books (several are available as paperbacks). You may never reach the point of making cattail pollen pancakes with catbrier syrup, but the foods described here will give you a taste of the "fruits" of foraging.

Good greens to try include dandelion and milkweed. Gather dandelion greens when they're young and tender, before the plants bloom. Washed, then boiled for about five minutes, they are delicious with butter and salt. If you cover dandelion plants with cardboard, lawn clippings or any material which keeps the sun from them, they produce tender blanched leaves. Besides the leaves, the roots and flowers are edible (or drinkable in beverages, including wine). Euell Gibbons has a delightful chapter on dandelions in *Stalking the Wild Asparagus.*

Milkweed forgives. If you're too late for the young shoots (less than eight

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inches tall), you may still be able to harvest some tender top leaves. If you miss both, there's still the unopened flower buds or, finally, the young pods (as long as they are hard, not spongy). All of these growth stages can be prepared the same way: first put through three or four one-minute boiling-water rinses, then boiled for several more minutes and served with butter or a sauce. The initial boiling water rinses are vital since they help remove bitter-tasting chemicals, although the amount of bitterness, and the number of required rinses, varies widely. The same method can be used to remove bitterness from dandelion and poke. Never add the plants to water before it boils; this seems to fix the bitterness rather than remove it.

Mushrooms play an important role in fine cooking. The commercial variety is fine, but anyone capable of telling broccoli from brussels sprouts can also learn to identify a few delectable, safe and free wild species. First study (and take along) a good field guide to the mushrooms of your region. Three of the best mushrooms to watch for: the morel, genus *Morchella* (midspring); the shaggy mane, *Coprinus comatus* (midsummer); and the honey mushroom, *Armillaria mellea,* which appears in incredible quantities over about a two-week period in the fall.

A good drink, similar to lemonade, can be made from the seed heads of staghorn sumac. Gently stir about ten average-sized seed heads around and around in a pitcher of water, then remove them, strain out any loose berries, and sweeten to taste. Large quantities of the seed heads can be collected in late summer and stored dry, in paper bags. Collect the seed heads before heavy autumn rains if possible, since their tart taste comes from water-soluble malic acid crystals which are on the outer surface of each little fruit. Avoid crushing the berries; the insides have a bitter taste.

Crayfish are much sought after as food in Louisiana and parts of the Great Lakes region, yet strangely neglected in many places. They live in streams with rocky bottoms, especially in deep pools. Crayfish are most active at night, and some-

times gather in great numbers when they mate, usually in the fall. They can be caught in a number of ways. One is a crab line—a piece of fat bacon, a fish head or other chunk of meat tied to the end of a weighted line. The bait is tossed out into a stream, left alone for a few minutes, then gently pulled in. Before lifting the bait clear of the water, slip a net under the crayfish which cling to the bait.

To prepare for cooking, grasp a crayfish by the cephalothorax (just behind the claws, to avoid being nipped), hold the tail with the other hand, and give a slow, twisting pull. This removes the tail from the body, and also kills the crayfish. If the crayfish has large claws, remove them, too; there's tasty meat inside. Otherwise, just keep the tails.

Next, hold the tail in one hand and grasp the central tab of the telson (the flipperlike appendages at the end of the tail) in the other hand. A pull on the telson removes the intestinal tract (much as shrimp are "deveined"). With experience you can prepare a crayfish every few seconds, with two quick pulls and a couple of twists.

Drop the tails in lightly salted water at a rolling boil. Cover the pot and bring it to a boil again for about eight minutes. The cooking time varies with the size of the crayfish tails (the larger, the longer time needed), and also with the relative thickness of the shells (which seem to vary from region to region). After cooking, shuck off the shells. Any crab, lobster or shrimp recipe can be adapted to crayfish. The tails are small, but it takes only about a pound to make crayfish Newburg for four people.

Bon appétit!

A bud cluster on a milkweed, used for food, medicine and dye.

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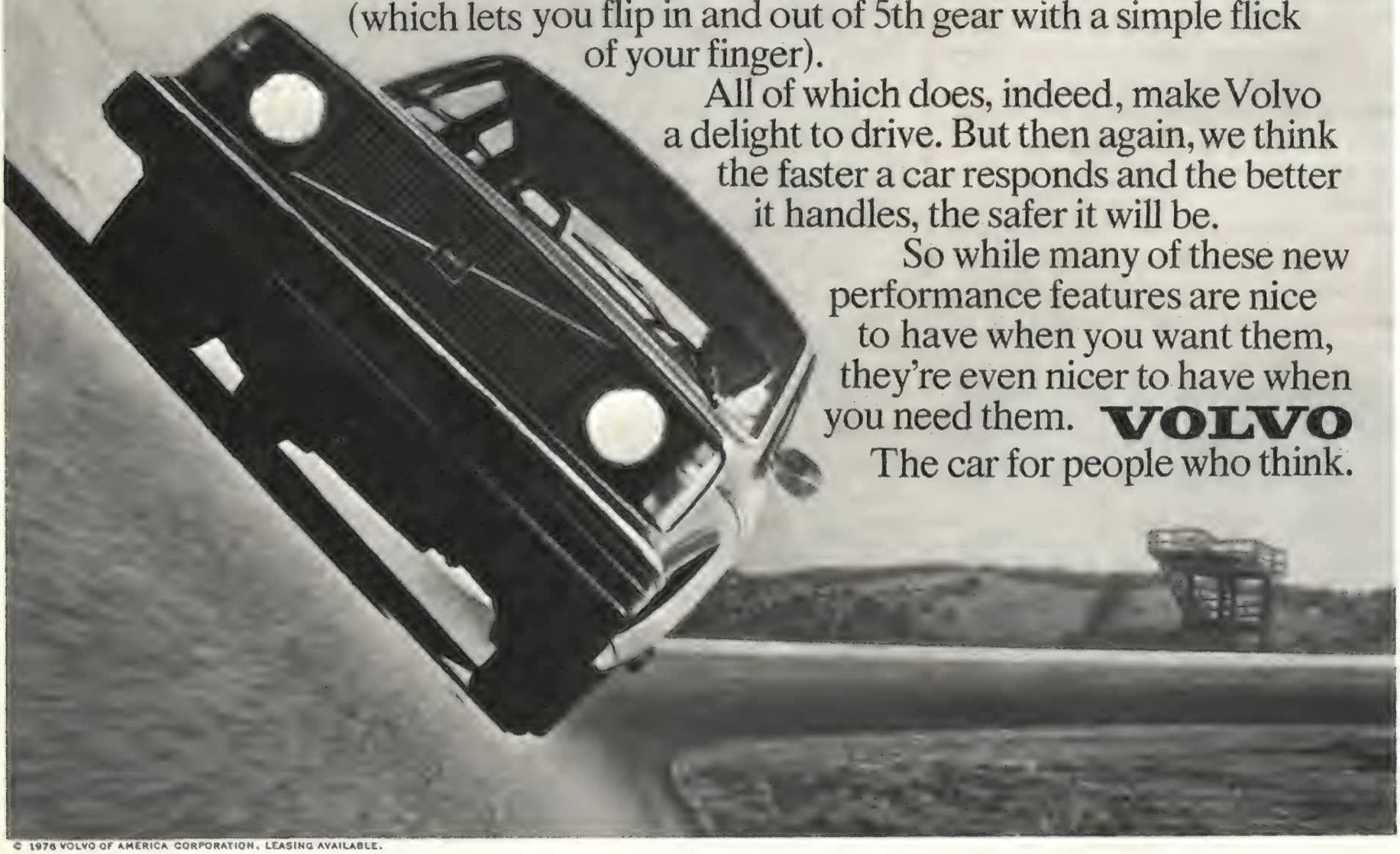

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By Sherwood B. Idso

Dust devils and tornadoes

A scientist rushes toward a not quite visible dust devil with a smoke generator; the smoke makes the vortex highly visible, below.

Fair-weather desert whirlwinds can be turbulent, but they are easier to study than their violent cousins

"It's dissifading!" yelled 3-year-old Craig. "You mean dissipating," chorused Grant and Keith, his two older brothers. "That's what I said," came the reply, as the huge dust devil we had been watching suddenly lifted from the ground and dissolved into a diffuse phantom shape in the searing desert sunlight.

Before its last telltale traces had completely vanished, another writhing funnel was bearing down upon us. This time the boys were ready and ran to meet it. Wearing face masks and goggles, they charged into the ominous column of dust and released colored balloons that could be used to trace the ascending air currents. All the while I watched from a distance and recorded their actions with a timed sequence of photographs.

Sometimes the funnels came in pairs and sometimes in groups of as many as six or seven. After two hours, almost 100 dust devils had been counted. Our midday foray onto the barren fields of the Gila Bend Reservation just south of Phoenix was a success. Operation Dust Devil was alive and well and beginning to bear fruit.

Trained in the atmospheric sciences, I long ago acquired a keen interest in vortex wind phenomena and, upon moving to Arizona nine years ago, I began to study that ubiquitous denizen of the desert—the common dust devil. Because dust devils share many similarities with the tornado, I have observed them regularly for the past several summers in hopes of coming to a better understanding of their more dangerous relative.

Dust devils are generally fair-weather phenomena. They form on clear days when the sun heats the surface of the earth to a temperature several degrees above that of the overlying air. This situation occurs most readily if the ground supports no vegetation and is dry and dusty. The ground in turn warms the air adjacent to it; an unstable situation is created in which the lighter, warmer air has a tendency to rise. Because the surface layer of warm air cannot rise as an intact sheet, convective plumes begin to form at discrete points. Inrushing air at the bases of these rising bubbles supplies additional energy and initiates rotary motions that intensify as the vortices grow in height.

Funnels thus formed tend to move with the local wind and usually lean slightly forward in the direction of their movement. Often, however, a dust devil may come to a standstill if it reaches the top of a small hill or ridge. One was once reported in Mexico near Altar, Sonora, that stopped near the edge of a railroad embankment and remained there for four hours. It removed about a cubic yard of sand per hour, and its erosive action was not stopped until a bulldozer was driven into it.

Not all dust devils are formed by so straightforward a mechanism. Some begin as eddies in local dust storms downwind of hills and mountains; others form when

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wind systems encounter small mountains that force them to buckle upward and break at the top, thereby forming two oppositely rotating vertical dust devils.

One of the more interesting cases is the formation of whirlwinds in Ventana Cave, the home of the dust devil in Papago Indian folklore. Julian D. Hayden tells that while conducting an archaeological excavation there in 1942, tiny whirls of dust would start up in the rear of the cave and increase in size as they approached the cavern's mouth. By the time they reached the top of the talus, the whirlwinds were powerful enough to take wheelbarrows and planking with them. Hayden and his fellow workers watched them for miles in their progress across the desert to the east, where they grew to several hundred feet in height.

According to a Papago legend about Ventana Cave, if someone built a fire of ironwood in it on a forbidden spot, the dust devil power would spring up and spread flames over everything, flames that could be extinguished only by placing a special flat stone in the center of the fire. Hayden reports that two of his men had once taken refuge in the cave during a December rain. Not thinking, they had built an ironwood fire on the prohibited spot. They went to sleep but woke soon after to find their blankets ablaze. One of the men remembered the protective powers of the talisman, found the stone, placed it in the fire—and the wind promptly stopped. Interestingly, in this particular area the excavators found

A meteorologist by avocation, physicist Sherwood Idso has written about other Southwestern dust storms in SMITHSONIAN.

Two of the author's sons prepare to release balloons into a dust devil.

very few ashes for perhaps a meter or so beneath the surface; so the legend had apparently had a long history and, Hayden notes, a logical explanation, in that rising hot air would probably always form a vortex in association with the outward air flow of the cave.

Throughout history we find that dust devils have been a subject of fascination to many people and cultures. Marcus Annaeus Lucanus recorded that Roman soldiers marveled at them in the Libyan desert; and in the Byzantine church of Hagia Sophia in Salonika, Greece, the capitals of the columns—which date back to the fifth century—show acanthus leaves violently twisted about as though by dust devils. Even Aristotle and Pliny the Elder included descriptions of the strange whirlwind in their writings.

One of the most consequential dust devils in all history may have occurred in A.D. 624. As described in Jack Cooley's account, Mohammed, during his first great religious battle, awakened from a spiritual trance, picked up a handful of sand and flung it toward his enemies, reportedly with a holy curse. As he mounted his horse and charged into the midst of the fray, he is said to have been followed by a small dust devil that had apparently sprung up from the point at which he cast the sand. It rapidly grew in size and speed until it drew abreast of him and swept violently into the enemy swordsmen. This unexpected event so blinded and confused them that the greater portion turned and fled, thus assuring the first Muslim victory.

My sons and I experienced a very similar occurrence on the Gila Bend Reservation one day. We had just arrived when

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the boys jumped out of the car and headed for the adjacent bare field. It was powder dry, and as they alighted on the field a small whirlwind formed at their feet. Grant thought that he had created it and sounded the call for his younger brothers to chase after it with him.

As they scrambled across the field in close pursuit of the funnel, I started taking pictures. Suddenly the dust devil slowed its forward motion, and the boys caught up with it. I shouted to them to charge into the center of it, as they had done so often in the past. This time, however, their instincts told them better.

In a few short seconds the dust devil seemed to take on tornadic proportions; and the howl of the wind within it was audible to me many yards away. As carefree as the boys had been in the past, they realized that the intense, sleek funnel before them was something to be respected from a distance. They just stood and watched for a minute or so. Then the dust devil moved out ahead of them again and finally dissipated in the distance, majestically lifting off the ground in tornado fashion.

Small animals have been observed to create dust devils. The paths of jackrabbits and coyotes across the desert are sometimes marked by a succession of miniature whirlwinds. More deliberate dust devil creation was practiced by the Apache Indians. They are said to have produced them by setting fire to the spines of certain columnar cacti of the Southwest. The resultant convective plume of heated air often acquired a rotary motion from passing breezes that formed a small whirlwind.

On another of our forays onto the Gila

Tornado on Mormon Lake in Arizona, left, shows many similarities with a

dust devil, such as the one at right in the Gila Bend Indian Reservation.

Bend Reservation, we observed a much larger-scale repetition of this same phenomenon. The Indians were burning some of the stubble in their fields, and a huge fire was raging about ten miles from us. So intense was it that a prior photograph from the roof of our home in Tempe revealed enough condensation at the top of the smoke column to create a small cloud.

As we watched the fire, we suddenly saw a group of large black funnels rise from the field and stretch into the sky. The larger ones were calculated to extend more than a mile into the atmosphere and had base diameters on the order of 100 yards. These funnels were not true dust devils, but what are known in meteorological circles as "fire whirlwinds." They are a type of vortex wind phenomenon that has been successfully photographed no more than a half-dozen or so times (p. 136).

They are sometimes destructive

Although the Indians are responsible for the earliest accounts of dust devils in the Southwest, reports of some very strong dust devils can be found in weather records of early white settlements. The official reports for Phoenix record that on May 29, 1902, a "violent whirlwind" passed through the city from the southwest at 3:15 P.M. It demolished a livery stable and damaged several sheds and minor buildings. The very next day a similar whirlwind unroofed a store in the center of town. On both days the skies were reported to have been clear, implying that the whirlwinds were typical fair-weather dust devils.

Even as recently as 1964, a church under construction in Tucson was destroyed by a dust devil, once again underscoring the fact that dust devils are not always to be taken lightly. Indeed, dust devils regularly overturn house trailers and down power lines every year in Arizona, and T. Theodore Fujita, one of the world's foremost authorities on tornadoes and associated vortex wind phenomena, has stated that they have even picked up cars. His studies have led him to think that dust devils of extreme intensity are more violent than 25 percent of all tornadoes confirmed in the world during recent years.

With these facts in mind, I have tried to look for similarities in dust devils and

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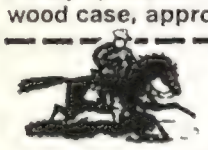

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tornadoes that could shed more light on mechanisms associated with the more elusive tornado (elusive, that is, only in the sense that scientists rarely have them occurring where and when they want them for study).

I have found that in Arizona there have been tornadoes and dust devils that were virtually identical in size, shape, wind field and life cycle. These findings have attracted the interest of investigators concerned with severe storms, and several scientific studies presently in progress use the common dust devil as a model of tornado characteristics.

Perhaps the most interesting of these studies are some I recently conducted on the Gila Bend Reservation with researchers from the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). One team used infrasonic microphones designed to pick up low-frequency sounds that may be generated by vortex wind fields. Such sounds have been detected in conjunction with severe thunderstorms, but their precise mode of generation is still a matter of speculation. Scientists are hoping that if low-frequency sound waves can be detected in dust devils, a better theory of their genesis may be forthcoming which could lead to the development of equipment capable of detecting severe storm systems that may produce tornadoes.

Other teams used infrared Doppler laser equipment to measure wind speeds in dust devils. In this technique an intense beam of infrared (heat) radiation generated by a carbon dioxide laser is directed at a dust devil; the moving dust particles scatter some of the radiation back to a detector. Comparison of the reflected radiation's frequency spectrum with that of the emitted radiation allows the velocity of the particles in the dust devil vortex to be determined. The results were surprisingly low: the fastest velocity recorded was just 47 miles per hour, for a dust devil in Nevada. The fastest Arizona dust devil had wind speeds of only 22 miles per hour. The instrument also revealed the structure within the vortices, including what may be whirlwinds within whirlwinds.

The NOAA team also has been trying to obtain comparative data in Florida on waterspouts, the spray-filled whirlwinds that stretch from sea to cloud in tropical waters. Last year they found that ground-based lasers did not have enough range; they were to return this month with airborne instruments. Eventually they will close in on their ultimate goal, hunting for full-fledged tornadoes in Oklahoma.

The significance of the desert dust devil may thus soon extend far beyond the regions where it normally occurs in profusion. This meteorological phenomenon is now on the verge of yielding some of its most long-kept secrets—secrets perhaps shared by the more ominous tornado. The desert dust devil thus presents a paradox. It is a symbol of uncommonly fair weather, yet a potential key to understanding the most violent of atmospheric storms.

A rarely photographed fire whirlwind (center) stretches full mile up into the sky.

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B. ROOKS ARE RETURNING. Even with the snow still on the ground the annual return of the birds marks the beginning of spring and the end of the long winter. 5-1/2 by 3-1/2 inches. 300343 $50.00. $45.00 Members (3.00).

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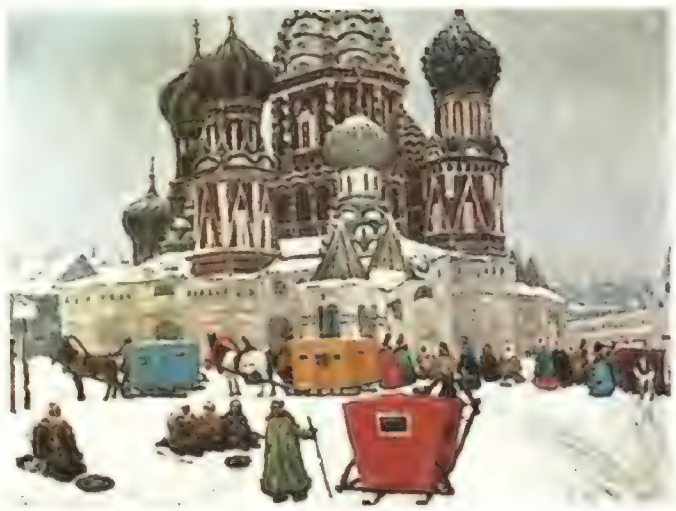
H. DOLL HOUSE, c. 1898 exterior and interior (no greeting) 5-1/2 x 5-1/2 inches 513325 15 cards $3.50. $3.15 Members (.35).

A.

B.



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J. "GOD BLESS THE CHILDREN" 1882-1883 advertisement (Merry Christmas) 4-1/8 x 7 inches 508002 15 cards $3.50 $3.15 Members (.35).

K. BIRD APPLIQUE Detail from cotton pieced work and applique quilt (no greeting) 5-1/4 x 5-1/4 inches 507970 15 cards $3.50 $3.15 Members (.35).

L. POINT OF TRANQUILITY, 1958 Acrylic on canvas by Morris Louis (no greeting) 5-3/8 x 7 inches 508010 15 cards $3.50. $3.15 Members (.35).

M. BEATTY'S BARN, 1937 Watercolor and pencil on paper by Peter Blume (Season's Greetings) 3-5/8 x 8-1/16 inches 513275 15 cards $3.50. $3.15 Members (.35).

N. ST. BASIL, 17th century tempera on wood, Russian (Merry Christmas) 3-1/2 x 8-3/4 inches 508028 15 cards $3.50 $3.15 Members (.35).

O. RASPBERRY ICICLE, 1967 Acrylic on canvas by Gene Davis (no greeting) 4-1/8 x 7-3/4 inches 507905 15 cards $3.50 $3.15 Members (.35).

K.

L.

M.

O.

N.

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A. A GENTLE NUDGE to help youngsters learn and adults recall their ABC's. This 6-1/2 inch plate is perfect for a child, and serves equally well when the older members of the family gather for salad or dessert. ABC plates of this sort were made at several glass houses in the United States during the late 19th and early 20th centuries. 316828 $8.50. $7.65 Members (.75).

B. CAST A WARM GLOW with this lovely glass candlestick that features several familiar lacy glass motifs. Dating from the 1830 to 1840 period, the original resembles pieces made by the Boston and Sandwich Glass Company Height: 5-1/8 inches. 316810 $15.00. $13.50 Members (1.25)

C. TOAST IN A NEW YEAR with this 4 ounce wine glass based on an original made by the Portland Glass Company of Maine between 1863 and 1873. Its simple grape leaf and panel design is eminently suitable for today's living and will be a handsome addition to any table setting. 5 inches tall. Available in sets of four. 325480 4 for $45.00. $40.50 Members (3.00)

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C. TOAST OUR 201st YEAR with this pewter punch cup It is an adaptation from a punch set given to Colonel George Armistead by the citizens of Baltimore. Presented in recognition of his role in defending Ft. McHenry against a British attack during the War of 1812, the original is now on display in the Smithsonian's 1876 Exhibition. 3-3/4 inches in height, the cup has an ample 9 oz. capacity. 314252 $16.50. $14.85 Members (1.25).

D. SET AN ELEGANT TABLE with this silver plated wine coaster reproduced from one owned by George Washington. Our reproduction is every bit as useful as the original which dates from the last decade of the 18th century. Diameter 5 inches. 315077 $25.00. $22.50 Members (2.00).

E. A CENTERPIECE FOR ALL JOYOUS OCCASIONS This elegant spiral bowl (also shown on the cover) is based on a piece of European pewter made in the late 19th or early 20th Century in the art nouveau style. Diameter at top, 6-1/4 inches. 328021 $32.50. $29.25 Members (2.50)

Mark your Days with Handsome Smithsonian Calendars

Our calendar collection for 1977 reflects the immense diversity of the Smithsonian itself...helping to guarantee that there'll be a calendar just right for you, whatever your taste or need.

A. AMERICAN DREAMS AND FANTASIES. This year's Smithsonian Engagement Calendar reflects the dreams, visions, and aspirations that have been held by Americans both individually and collectively throughout our history. This theme is illustrated by an array of materials from the Smithsonian's collections including paintings, cartoons, prints, science fiction drawings, posters, sculpture and textiles. Over a hundred illustrations (40 in full color) and an accompanying text drawn from contemporary sources are certain to provide a fascinating look at this aspect of the American character. The calendar measures 7 by 9 inches closed. 513333 $4.50. $4.05 Members (.50).

A

"I Summon you to Comradeship in the Red Cross"
January
Sun Mon Tues Wed Thurs. Fri Sat
1 New Year's Day
15 Martin Luther King's Birthday

B.

C.

B. Ms. AMERICA. This calendar takes its inspiration from twelve reproductions of early 20th century posters portraying American women both symbolically and realistically. The posters are produced as color postcards that can be detached from the calendar at the end of each month. Each card measures 5 by 7 inches and the calendar measures 5 by 9 inches overall. 513366 $3.50. $3.15 Members (.35).

C. AMERICAN VISION. Jackson Pollock, Winslow Homer, George Catlin and nine other leading artists are represented in this superb wall calendar...providing you with 12 distinct views of America. Each plate is beautifully reproduced in full color on a calendar measuring 14-1/2 by 21 inches, opened. 513341 $4.95. $4.45 Members (.50).

D. TOWN & COUNTRY. Centering around the theme of the city and countryside this elegant wall calendar contains twelve full color reproductions of works from the collections of the Smithsonian's Hirshhorn Museum and Sculpture Garden. Among the artists represented are Robert Delaunay, Arshile Gorky, Robert Rauschenberg, Raphael Soyer, Stuart Davis, and Joseph Stella. The overall dimensions of the calendar are 11 by 18 inches. 513358 $10.00. $9.00 Members (.95).

1977

Thursday	Friday	Saturday
		1
6	7	8
13	14	15
20	21	22
27	28	29

D.

Smithsonian Jewelry to Lend That Special Look

A. THE SIMPLE MOTIF of these pierced earrings and necklace comes from silver originals made by the Araucanian Indians of Chile and the Argentine pampas. We have adapted the pieces for modern use in silver plate. The necklace is designed with a 15 inch chain. Pierced earrings: 400176 $8.50. $7.65 Members (.50). Necklace: 400168 $20.00. $18.00 Members (1.00).

B. MEXICAN TRADING CROSS. This silver plated double pendant cross is based on the Smithsonian's original dating from the late 1700's. Crosses of this type were made as trade items in Old Mexico for use by Spanish missionaries in New Mexico. 3-1/2 inches in length. 24 inch chain. 400069 $10.00. $9.00 Members (.75).

C. DOUBLE HAPPINESS. Based on a piece of white nephrite jade bearing the symbol of happiness from Ching period (1644-1912). Our gold plated pendant brings joy to the wearer and the beholder. 2 inch diameter on a neck ring. 400184 $10.00. $9.00 Members (.75).

D. BUTTERFLY. The butterfly, a Taoist symbol of immortality and felicity, is a well known motif for both Chinese porcelain and embroidery. Our gold-plated butterfly is felicitously adapted from a white nephrite jade piece in the Smithsonian's collection. 17 inches in length overall. 400200 $12.50. $11.25 Members (.75).

E. THE WONDER OF FLIGHT. Ever since the Montgolfier brothers ascended a balloon in 1783, we have been fascinated with the soaring freedom of lighter-than-air flight. These blazer buttons and cuff links are based on a late 19th Century button portraying the Montgolfier balloon. Available in both pewter and gold plate. Cuff links: pewter 400226 $9.50. $8.55 Members (.75). gold plate 400259 $18.50. $16.65 Members (.75). Blazer buttons: pewter 400234 $12.50. $11.25 Members (.75). gold plate 400267 $38.50. $34.65 Members (.75).

F. RUSSIAN CROSS. The original of our gold plated cross comes from Russia. It served as an amulet combining various forms of crosses. 2 inches, 24 inch chain. 400093 $12.50. $11.25 Members (.75).

G. HAPPINESS SYMBOL. The central symbol of this gold plate pendant is an ornate, highly conventionalized character for happiness surrounded by a band of discs symbolizing clouds. The original was carved in jade during the Ching period (1644-1912). 1-7/8 inches on a neck ring. 400192 $10.00. $9.00 Members (.75).

H. A CASTLE OF YOUR OWN. A stamp issued on the occasion of the Smithsonian's centennial in 1946 is laminated on solid brass to form a handsome and sturdy key chain. 4-3/4 inches overall. 301556 $3.50. $3.15 Members (.30).

I. DANISH WEDDING MEDALLION. This charming gold-plated pendant is based on a coin issued to commemorate the marriage of Crown Prince Christian IV in 1635. The marriage's anticipated happiness was symbolized by clasped hands with hearts and flowers. 1-3/4 inch diameter on a 24 inch chain. 400218 $10.00. $9.00 Members (.75).

J. "LONG LIVE THE PRESIDENT". In creating these jewelery pieces we adapted a button made to commemorate the inauguration of George Washington in 1789. Available as a pendant, cuff links, and set of blazer buttons in pewter or gold plate. Pendant 1-3/8 inches. Cuff Links: pewter 400010 $9.50. $8.55 Members (.75). gold plate 400044 $18.50. $16.65 Members (.75). Blazer Button: pewter 400028 $12.50. $11.25 Members (.75). gold plate 400051 $38.50. $34.65 Members (.75). Pendant: pewter 400002 $12.50. $11.25 Members (.75). gold plate 400036 $29.50. $26.55 Members (.75).

The Children's Corner

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P. A CHILD'S GARDEN OF SCULPTURE, by Elinor Lander Horwitz. This sensitively illustrated book follows a group of children during a visit to the Smithsonian's Hirshhorn Museum and Sculpture Garden. The reader joins in as the youngsters learn to appreciate and understand the special language of sculpture. 087452 $2.50. $2.25 Members (.25).

Q. FOR HOURS OF COLORING. This collection of five handsomely detailed coloring books has been selected to illustrate youngsters favorite Smithsonian exhibits. Subjects include *Uniforms of the American Revolution, North American Indian Design, Audubon's Birds of America, Seashore Life* and *Visual Illusions*. 094441 $7.50. $6.75 Members (.70).

R. COLORING THE SMITHSONIAN. Perhaps the most original coloring book ever made, it contains 8 sheets that fold out to 11 by 25 inches and that can be de-

tached and hung in a child's room. Illustrated by Margaret Brown, the coloring book highlights famous and popular exhibits at the Smithsonian from dinosaurs to a space capsule. 019018 $1.50. $1.35 Members (.25).

S. McGUFFEY'S ECLECTIC PRIMER. A reprint of the 1909 edition of this fondly remembered book. A nostalgic look at how generations of Americans learned their ABC's. 081810 $2.75. $2.45 Members (.30). Not pictured: A set of seven McGuffey readers from the primer through the sixth reader. 094482 $25.00. $22.50 Members (2.00).

T. A BREEZE TO FLY! Based on a principle developed by Alexander Graham Bell at the turn of the century, this tetra kite is certain to capture the fancy of anyone over six years old. The kite is easy to assemble, launch, and keep flying. It comes complete with its own 500 foot spool of 30 lb. test nylon cord and measures 33 inches on edge. Also available but not pictured is the 4 kites in 1, *super* tetra kite which measures a colossal 5-1/2 feet. It comes with a 1,000 foot spool of 60 lb. test cord. Tetra kite with string 617936 $7.30. $6.55 Members (.60). Super tetra with string 617944 $23.00. $20.70 Members (1.50).

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C. A BEAUTIFUL MINERAL specimen served as the inspiration for this needlepoint design. The specimen is a slab of Rhodochrosite, a manganese carbonate from Argentina. The kit includes a #12 Interlock canvas with full color 14 inch square design, 3 ply Persian wool, needles and instructions. 328062 $29.50. $26.55 Members (1.50).

D. AMERICAN SAMPLER The delightful motifs of this needlepoint kit have been adapted from a cross stitch sampler made in 1878. Our contemporary 16 inch square design is on #18 Mono canvas in full color. The kit includes 3 ply Persian wool, needles and instructions. 328054 $29.50. $26.55 Members (1.50).

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Book reviews

Harvest of a Quiet Eye, The Natural World of John Burroughs
Charles F. Davis
(Tamarack Press, $20)

John Muir's America
Dewitt Jones and T. H. Watkins
An American West Publication
(Crown Publishers, Inc., $20)

Among the long generation of their readers and fellow nature-lovers, John Burroughs and John Muir were known as John o' Birds and John o' Mountains.

The two were born within a year of each other: Burroughs in 1837 on a hard-scrabble farm in upstate New York where, as one of ten children, he observed early the deadening effect of constant toil; Muir in 1838 to a dour Scots father who emigrated to a Wisconsin farm, where his eight children experienced privations and paternal discipline so severe that Muir claimed it stunted his growth even as it inured him to physical hardship for the rest of his life.

From childhood both Burroughs and Muir found refuge and delight in the natural world—found sustenance, also, in books. Like so many gifted young men of their time, they were early captivated by Emerson, by Thoreau to whom Burroughs in particular was frequently to be compared, and later by Darwin.

Through highly popular nature writings—Burroughs' books sold a million and a half copies during his lifetime—both men attracted the friendship of such staunch wildlife enthusiasts as Theodore Roosevelt and E. H. Harriman. The railroad tycoon invited both to join him on the Harriman Expedition to Alaska in 1899. It was during this trip that gentle Burroughs, green with seasickness, turned a baleful eye on unafflicted Muir and wrote a classic couplet: "Where every prospect pleases/And only Muir is vile." Their friendship survived the barb, however, and when the two were in their seventies, Muir acted as Burroughs' guide through the Grand Canyon, surely one of the notable events in the nation's history of naturalism.

Harvest of a Quiet Eye and *John Muir's America* chronicle vividly both the striking parallels between the two lives and the marked differences.

John Burroughs, patriarchal Sage of Slabsides, was a gentle, nonaggressive man profoundly attached to his loving, if unlettered, family and to his native Hudson River country. *Harvest of a Quiet Eye*—the phrase is from Wordsworth—is a gentle book. Some of photographer Charles F. Davis' 43 color plates, seasonal views of Northern forests and waters, appear at first glance almost bland. But patience!

"The nature-lover is not looking for mere facts but for impressions," Burroughs wrote. The pictures are unobtrusive artistry in a book of impressions.

Not that facts are absent. Edwin Way Teale has written the informative introduction and Davis a satisfying biographical chapter fleshed out with well-captioned Burroughs family photographs. For the rest, the subject is allowed to speak for himself through numerous short passages and eight abridged but representative essays.

Davis has "tried to make the best pictures I could, trusting that Burroughs' words and my photographs would be sufficiently of one spirit to live amicably within the pages of a single book." He has succeeded admirably, the reader in the end left to note for himself the moving relationship among the naturalist's stoic creed, "I have no doubt that the life of man upon this planet will end, as all other forms of life will end," the face of an aged Burroughs grieving for his own loved dead, and the final photograph of a winter-stripped hawthorn holding a bird's nest with two eggs—of snow.

John Muir was a supremely restless man whose cure for any ailment was a lengthy wilderness journey, preferably

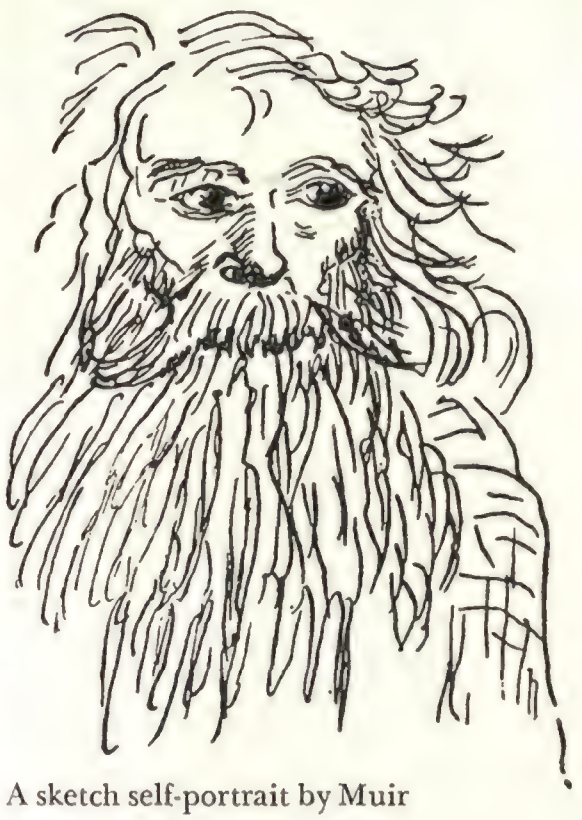
afoot. If he loved Yosemite Valley and the "glorious" Sierra Nevada most passionately of all regions upon Earth, he also loved Alaska, Arizona and many another wild region. He could be an effective and tireless activist, as witnessed by his presidency of the Sierra Club and his determined campaign to create and preserve Yosemite National Park.

John Muir's America is a handsome but restless book.

Young photographer Dewitt Jones reports that "The photographs I took [for this book] were only the remains of a banquet that was indescribable." The best of those "remains"—48 color shots of Muir's mountains and glaciers—merit his favorite adjective, "glorious."

The challenge of writing a major biography of a man who told his own story and described his own world in such colorful, energetic prose is great. T.H. Watkins, writer, editor and Sierra Club consultant, has met that challenge capably, if at times a bit overinsistently. As a young ecology student said recently, "We cannot return to Saint Francis." Nor perhaps can we turn for specific solutions of modern problems to John Muir.

Still, one wishes—if ungratefully—in all this book's rich and diverse materials not so much for the imaginary conversations as for more of Muir's authentic voice.



A sketch self-portrait by Muir from *John Muir's America*

Harvest of a Quiet Eye, a moving experience on its own terms, may send some readers back to Burroughs' extensive but now largely neglected works. *John Muir's America*, playing down the writer in favor of the inspired wanderer and activist, has chosen dramatically to celebrate a heroic life and the natural treasure that life helped to preserve.

—Margery Evernden
Assistant Professor of English,
University of Pittsburgh

John Muir's Wild America
Tom Melham
Photographed by Farrell Grehan
(National Geographic Society, $4.75)

The National Geographic's team of Melham and Grehan set out to trace Muir's journeys and to evoke his fervor and reverence. They walked in Muir's footsteps, through the Appalachian Mountains, south to Georgia and Florida, west to California, through the Sierra Nevada

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and the Cascades, and north to Alaska.

The Muir story, ever green, is well and discursively told by Melham in the style which has for so long endeared the *Geographic* to so many millions. Grehan, a master photographer whose work is often seen in SMITHSONIAN, has supplied a stunning series of photographs in color. True, the color printing would have to be even better printed to meet the excellence of the photography, but, at the price, the book is a great bargain; another service to the best of what is natural to America and the quality of an outstanding man who cherished and fought for it.

He lost a ten-year fight to save the stupendous Hetch Hetchy Valley just north of Yosemite. "Dam Hetch Hetchy!" he had stormed. "As well dam for water-tanks the people's cathedrals and churches, for no holier temple has ever been consecrated by the heart of man."

But, dammed it was, eternally. Muir felt his defeat in this case would spur his opponents to challenge the national parks concept. "They will see what I meant in time. There must be places for human beings to satisfy their souls. Food and drink is not all," he wrote.

Still, two years later, in 1916, the National Park Service, which Muir advocated, was established. Overall, he had won a greater victory.

—Bennett Schiff
Associate Editor, SMITHSONIAN

The Body Is the Hero
Ronald J. Glasser
(Random House, $8.95)

In Search of Penicillin
David Wilson
(Alfred A. Knopf, $10)

It appears as if the medical profession has contrived a grandiose myth that carries conviction in the community: namely, that doctors cure people. But doctors do not cure people. They may point the way, prescribe, inject, cut, urge, cajole, watch over—but they cannot cure.

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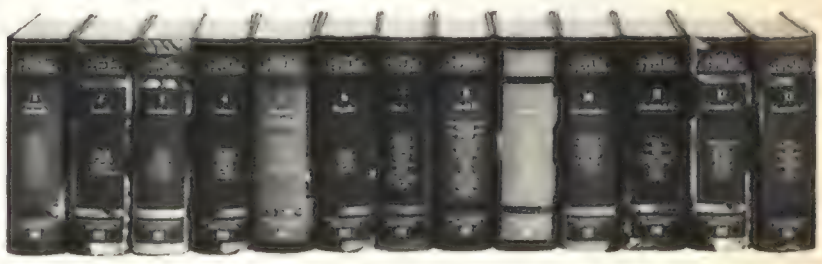

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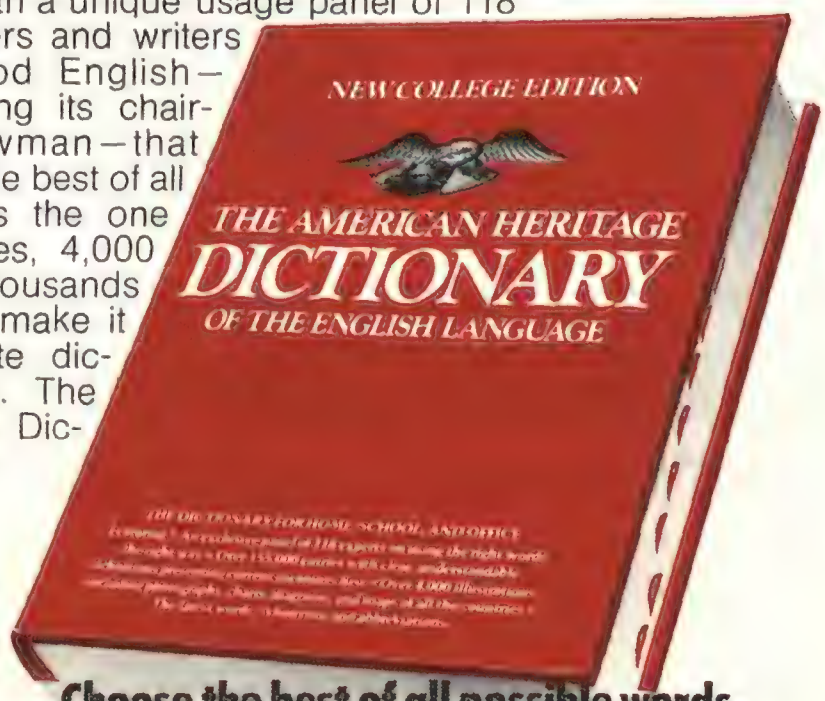

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for survival—to heal itself." That statement implies preventive medicine, the need for which is a major thrust of *The Body Is the Hero.*

Ronald Glasser, himself a physician, an instructor at the University of Minnesota Hospitals, and an accomplished writer, is something of a gentle, but nonetheless telling, gadfly. He deplores the lack of interest in preventive medicine among his colleagues, arguing that despite the "eloquent quietness of its achievements," it is "taken for granted when not actually played down."

Why should this be? One again sees evidence of the doctor-as-god myth. Preventive medicine has "none of the excitement of the emergency room or the glamour of the operating room." Nor has it the fame or fortune of the latter. And, finally, one must realize that many researchers are not practicing physicians, but scientists, a fact that has kept many brilliant persons from the results they might otherwise have achieved, had they not been "dismissed patronizingly by the medical profession."

If Glasser is a gentle gadfly, then David Wilson is the quintessential detective, allowing no shred of evidence to pass unnoticed. And, interestingly enough, *In Search of Penicillin* is as supporting of Glasser's thesis as it is a wonderful story in itself.

The search for penicillin has the stuff of high drama—conflict between medical authority (and prejudice) and scientific investigation; a brilliant cast, from Sir Alexander Fleming to Lord Howard Walter Florey and Sir Ernst Boris Chain; a trail of evidence often perplexing and misleading; and the ultimate triumph. To his credit, Wilson contains the drama, letting the events carry the weight themselves, without flamboyance. The result is a minutely detailed, crackingly good tale. Showing through always—despite the politics, the mythmaking, the reversals—is the relentless brilliance of the researchers. In the end, as Wilson believes, the industrial manufacture of penicillin by "the deliberate domestication of a micro-organism" was as important a stage in the development of mankind as the Agricultural Revolution, "which turned man from a hunter-gatherer into an agriculturalist and herdsman." One cannot argue with that logic.

—John F. Warner

Boston-based free-lance writer

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The Swedish Heritage in America
Allan Kastrup
(Swedish Council of America, $25)

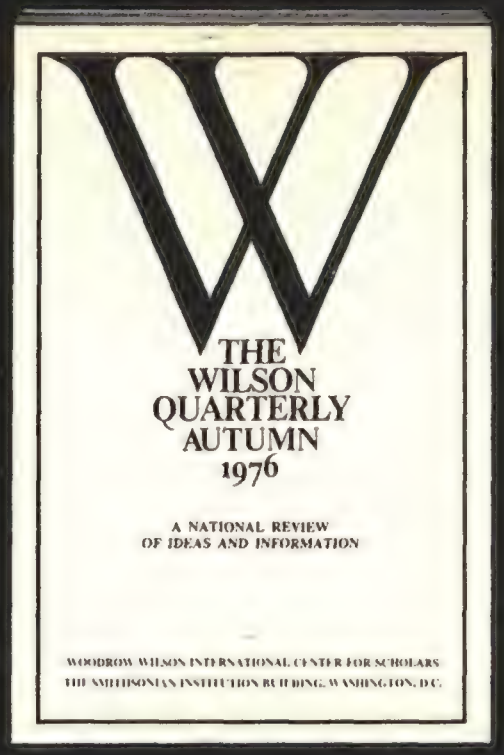
The Germanic People in America
Victor Wolfgang von Hagen
(University of Oklahoma Press, $12.50)

Peter Minuit is remembered as the man who bought Manhattan Island for the Dutch for $24. But in addition to negotiating that incredible bargain, Minuit was instrumental in a number of other important expeditions and enterprises which contributed to the early colonization of America. After having been discharged by the Dutch as governor of New Amsterdam, Minuit entered the service of the Swedish crown. In 1637 he was appointed leader of an expedition up the Delaware Valley which resulted in the founding, in March 1638, of New Sweden and the village of Christinehamn, the present-day Wilmington. Thus began the history of the Swedes in the New World.

In the following 330-odd years, there has been a continuous interaction between the two countries. Allan Kastrup, in *The Swedish Heritage in America,* writes the story of Swedish emigration, the history of the Swedes in America and their contribution to the building of the new country. He also discusses the cultural, religious, commercial and political connections between the two countries during this long period, and the historical background of these events in Sweden. His scope is ambitious.

A number of events surface from the mass of material—the story of Bishop Hill, for instance, a communal settlement in Illinois founded in the mid-1840s by Eric Janson. Nearly 150 people died during the first winter, but by the summer of 1847 things were going well. In spite of the cholera epidemic in the summer of 1849, which reduced the number of colonists, and the California gold rush which further depleted the ranks, Bishop Hill endured and in the 1850s prospered. The commune was dissolved in 1860 after the countrywide panic of 1857. It probably would have broken up anyway, because "members of the younger generation objected to the idea of working without payment in cash."

Today Bishop Hill is the second oldest of the still existing 19th-century Swedish settlements in America, and it is maintained as an Illinois state memorial and



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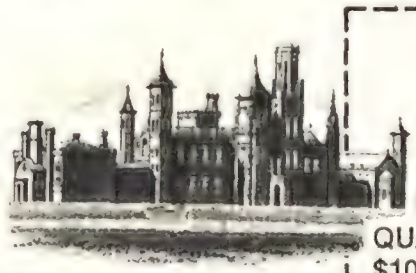

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Peter Minuit was born in Cleves, on the Rhine, and he was, therefore, a German, according to Victor Wolfgang von Hagen in *The Germanic People in America*. Minuit is mentioned among the German immigrants who made their appearance in North America in the early 17th century.

Von Hagen is concerned with the impact of Germanic culture on America—both north and south—from the "beginning" up to the unification of the German states in 1871. His emphasis is largely upon personalities. In the process, he focuses on such people as Baron Friedrich Wilhelm von Steuben, who wore the uniform of a major general in the Continental Army during the American Revolution. John Jacob Astor, born Ashdour in the Duchy of Baden in 1763, became the richest man in America. Baron Alexander von Humboldt's extensive studies in the Americas resulted in the publication, in the early 19th century, of a 30-volume work on the new continents consisting of more than 150,000 pages and 426 illustrations and maps. Carl Schurz arrived with the flood of German immigrants after 1848. In time, he would become an ardent supporter of Abraham Lincoln, a major general in the Union army, a Senator from Missouri, a Secretary of the Interior, an editor of the *New York Evening Post*, and biographer of Henry Clay.

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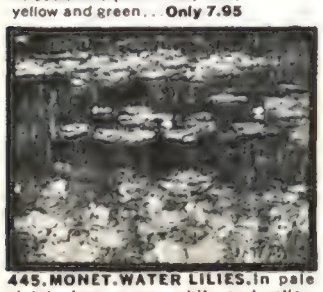

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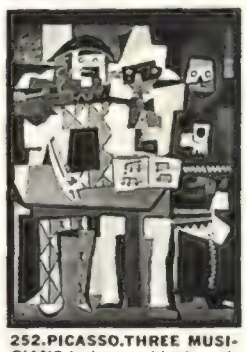

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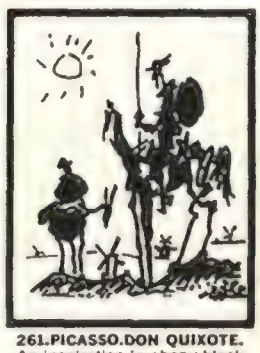

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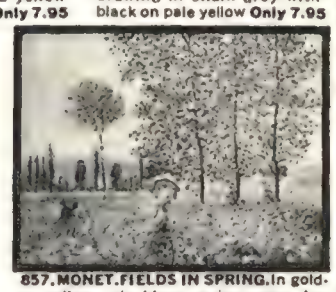

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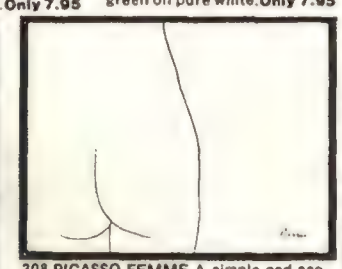

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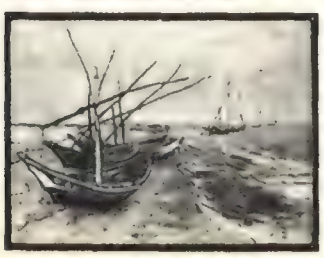

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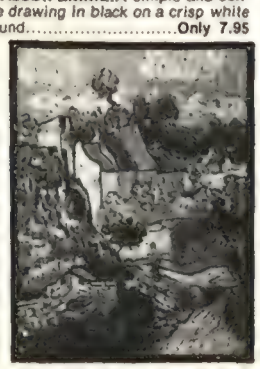

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Both books are, understandably, partisan in outlook and, at times, overly liberal in their definitions of Swedish-American or German-American people or experiences. In addition, they read too often as encyclopedias or dictionaries with "entries" following one another in a nominal fashion. Unknown or forgotten information and anecdotes relating to Swedish-American and German-American contributions to the New World enliven the texts, though, and make clear the debt all Americans owe to those two northern European nations.

—Frank R. DiFederico
Associate Professor,
University of Maryland

American Folklife
Edited by Don Yoder
(University of Texas Press, $16.95)

In his introduction to *American Folklife,* a collection of essays "on the folklife approach to our traditional cultural patterns," editor Don Yoder points out that "what we are witnessing is . . . a re-ethnicizing of America, a final ground swell of denial of the old 'melting pot' concept of American history, and in its stead a vigorous vote of confidence for the concept of cultural pluralism."

Folklife studies (regional ethnology) first developed in Europe to examine the traditional aspects of native European culture. Only recently has it become an academic discipline in the United States. It comes at a time when Americans are searching for their ethnic identity. "While black consciousness is the most conspicuous of these movements toward self-understanding on the American human landscape," writes Yoder, "the focus on civil rights and the rights of ethnic heritage and language have aroused many of our ethnic enclaves from the Mexican Americans of the Southwest to the French Canadians of the Northeast."

Besides new folklife courses in colleges, we have a new Folk Arts program in the National Endowment for the Arts; a Folklife Center in the Library of Congress, and the Smithsonian Institution's annual Festival of American Folklife, which, perhaps more than any other institutional venture, has brought attention to the folklife concept.

The Smithsonian's Folklife Festival began as a weekend event in 1967. This

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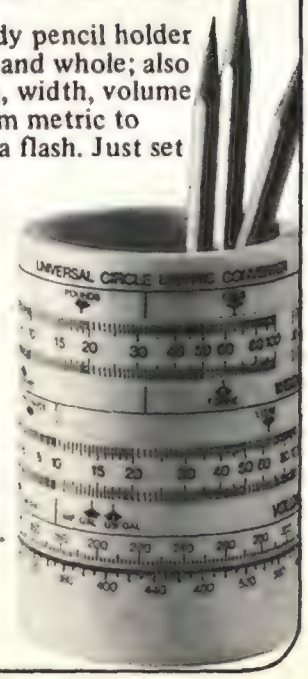

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Photo by Eddie Adams

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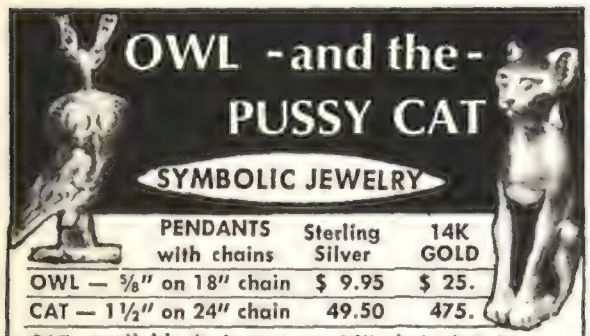

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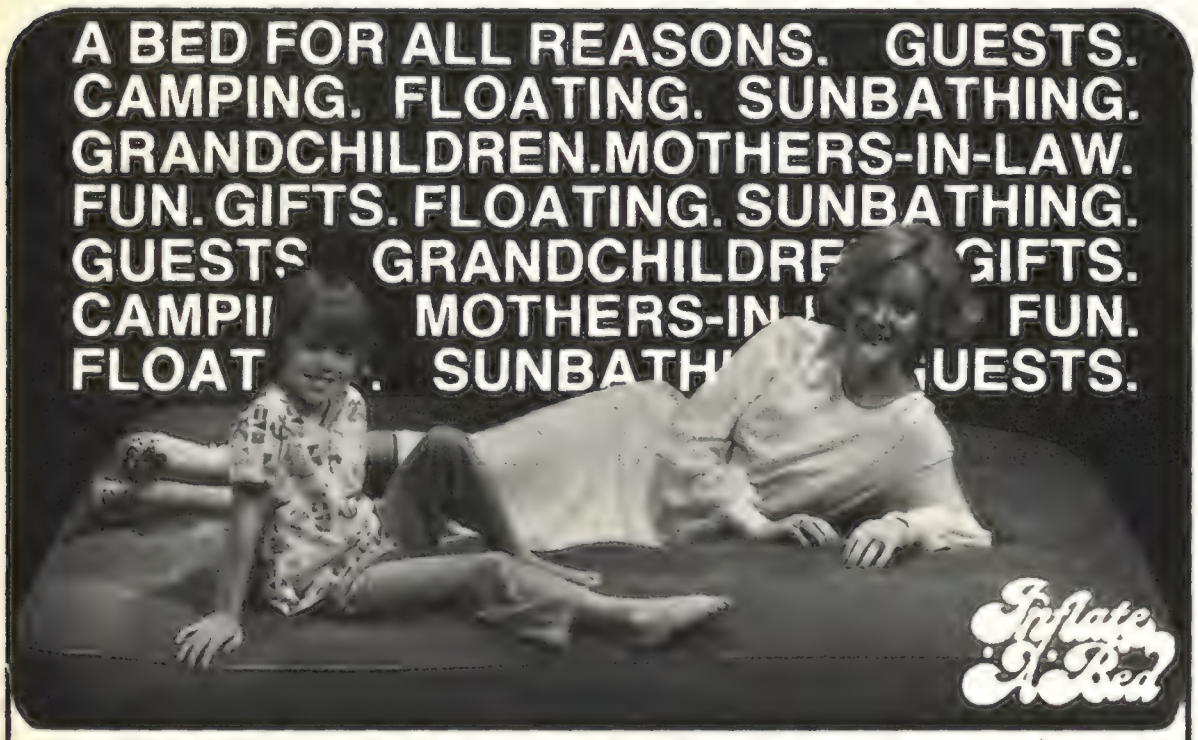

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Bicentennial summer, the Festival will run for 12 weeks and have 5,000 participants. It has become the largest cultural event of its kind in our nation's history.

The 12 essays selected by Don Yoder were done to show the breadth of approaches to folklife study. Beginning with an essay by Ward Goodenough that places folklife studies in the anthropological and ethnological sciences, the book contains a wide range of essays on various ethnic groups: an essay on the architectural history and setting of one folk-culturally significant building from rural Indiana; an article on turnpikes and tollgate lore in New York State; a paper on coil basketry in the Sea Islands; a paper on what one can learn of the historical origins of ethnic tensions between the Hispanos and Anglos in the lower Rio Grande Valley during the 19th century.

The question remains: why bother? Why trace back into our folklore?

Ward Goodenough in his essay, "Folklife Study and Social Change" gives this answer: one's "sense of worth and self-respect relate directly to questions of who and what one is and how the particular who and what are to be valued. Important among these features of a person's identity are his group affiliations —the groups with which he identifies himself and with which he is identified by others." Goodenough makes the further point, "if a person can take pride in the customs and traditions of his group, he can feel good about himself; but he can take pride in them only as others with whom he deals show respect for them."

Certain groups find this respect and identity much easier than others because of how our history books are written. A child of English or French ancestry can take pride in his heritage, while a Polish or Sicilian child sees little about his past in American texts. American Indians, too, cannot often discover a correct interpretation of their history in our books.

That is why the emergence of folklife studies gives us the opportunity to finally appreciate what is unique about *all* our cultures. Ralph Rinzler, director of the Folklife Festival, writes in the 1976 program: "As we face the serious world problems . . . it is the more crucial that we reaffirm our pluralism and cherish our differences while singing each others' songs."

—John Coyne
Author of several books on crafts.

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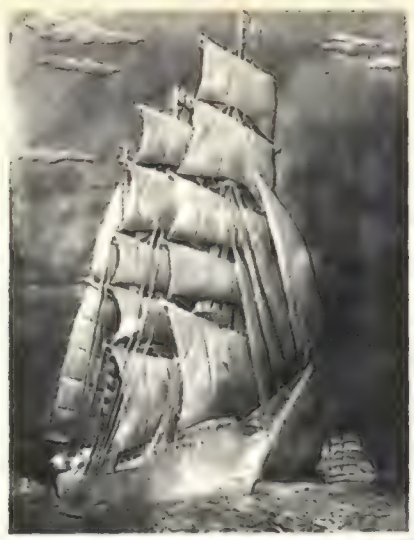

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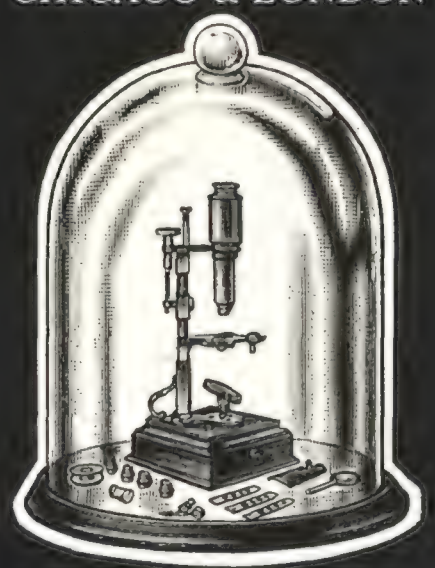

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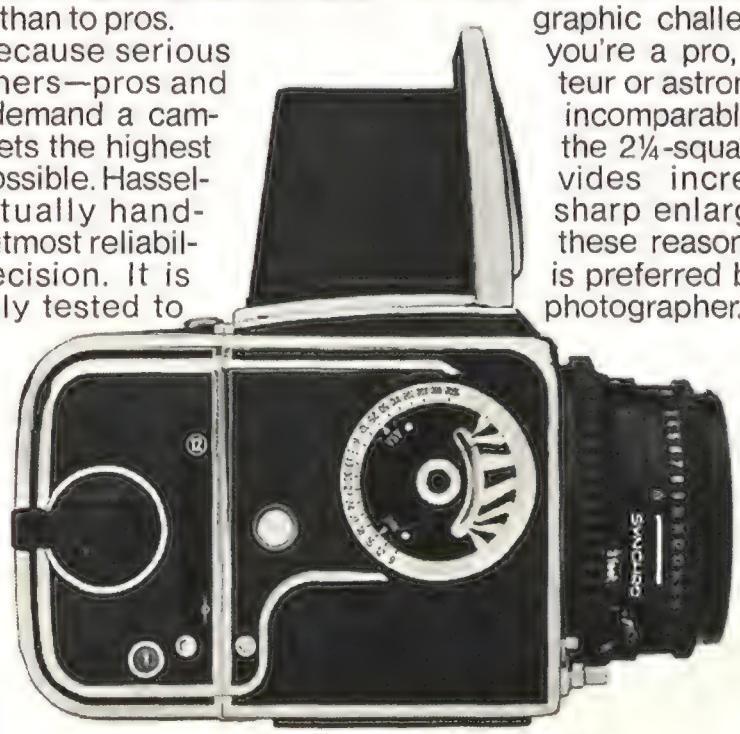

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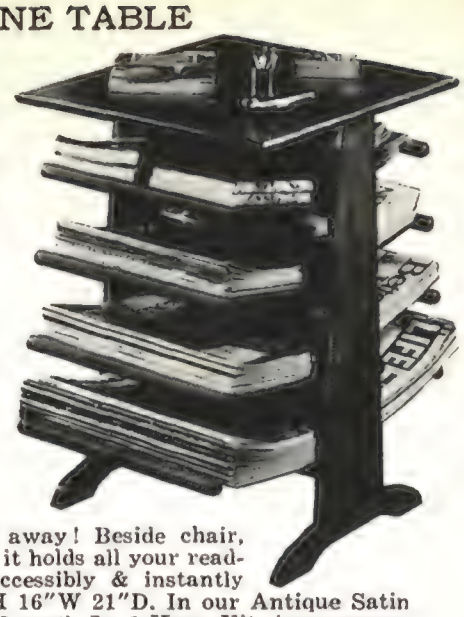

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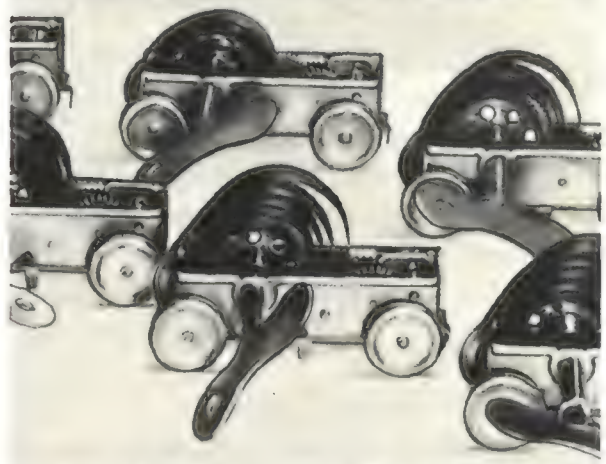

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Smithsonian highlights

Museum of Natural History

The enlarged Insect Zoo (see p. 8, August issue) is now open to the public, featuring insects and their relatives exhibited in both natural and man-made environments. Among the special creeping, crawling and flying delights are six-inch-long rhinoceros beetles (below), ten-inch-long walking sticks, giant millipedes, leaf-cutter ants and bees in a full-scale hive.

Fall Museum Hours

After Labor Day the Smithsonian museums return to regular fall hours, 10 A.M. to 5:30 P.M. daily. The Zoo is open from 9 A.M. to 4:30 P.M. and the Anacostia Neighborhood Museum from 10 A.M. to 6 P.M. weekdays and 1 to 6 P.M. weekends.

Rhinoceros beetle and admirer

Arts and Industries Building
"1876: A Centennial Exhibition" (see cover story, May issue, and p. 110 this issue) re-creates the atmosphere of America during the time of the Philadelphia International Exposition of 1876. More than 25,000 objects are exhibited in the completely restored building, including spectacular pieces of machinery and a 19th-century orchestrion.

Victorian Garden
Public tours of the garden led by specially trained docents are conducted Monday through Friday at 10 A.M., noon and 2 P.M. and weekends and holidays at 10 A.M., noon and 4 P.M. The area, on the west side of the Arts and Industries Building, is landscaped in the style of the gardens outside the Philadelphia Centennial's Horticultural Hall. It provides a delicate living exhibit of the art, science and composition of a Victorian garden.

Associates Dining in the Court
A new restaurant located in the West Court of the Natural History Building is open to Associates for lunch from 11 A.M. to 3:30 P.M. Beer, wine and an ample buffet menu are served in an elegant environment of natural and primitive decorative objects, highlighted by a glass mural of autumn leaves. The Court is within easy walking distance of the Mall museums and downtown Washington. Membership cards are required.

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National Portrait Gallery

"Artists and Models" is an exhibition of photographs and documents from the collections of the Archives of American Art. It concentrates on the 19th and 20th centuries, "the heyday of professional modeling in America," and explores through paintings, photographs and manuscripts the relationship of the model to the artist and the changing role of the model through history. Diaries and recollections reveal the intimate and often humorous details involved in the art of "sitting." The exhibition remains on view through November in the Archives permanent gallery in the National Portrait Gallery.

Traveling Exhibition Service

The Smithsonian Institution circulates art, history and science exhibitions on a rental basis to institutions throughout the United States and Canada. The range of participating organizations is as great as that of exhibition subjects. For information on bringing an exhibit to your community or for a complete listing of shows currently being circulated, write: SITES, Smithsonian Institution, Washington, D.C. 20560.

"The Dream of America: Swedish Emigration to the United States" (see p. 162) is a major Bicentennial SITES exhibition documenting Swedish emigration to the United States by examining the political, social and economic conditions of mid-19th-century Sweden, the journey to America and adaptation to life in the new land. Reproductions of archival material include photographs, maps, postmarks, newspapers, diaries and shipping agents' advertisements. A wood model of the

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transatlantic ship *Kalmar Nyckel*, an emigrant's trunk and personal belongings are part of the exhibit. One of three paintings by Olof Krans depicts the famous Bishop Hill community settled by Swedes in Illinois in the 1840s. The exhibition will be traveling to various communities for the next several years. For a schedule or information on bringing the exhibit to your community, call Quinton Hallett (202) 381-6631.

Associates Reception Center

Associates visiting the Smithsonian may obtain a specially prepared Bicentennial packet of information after registering at the Associates desk in the Smithsonian castle on the Mall. For information in advance of a trip to Washington, write the Associates' Reception Center, Smithsonian Institution, Washington, D.C. 20560. For travel information relevant to the original 13 states, write the same address but mark it: "Attention: Museum Reference Service." For telephone inquiries, call (202) 381-6264.

Air and Space Museum

The new museum is now open to the public (see June SMITHSONIAN and pp. 34 and 111-113 this issue). The Albert Einstein Spacearium presents *Cosmic Awakening* hourly (for information, call 381-4210), and the NASM Theater presents the film, *To Fly*, every 45 minutes (call 381-4126). Public parking is available in the museum's underground garage.

Anacostia Neighborhood Museum

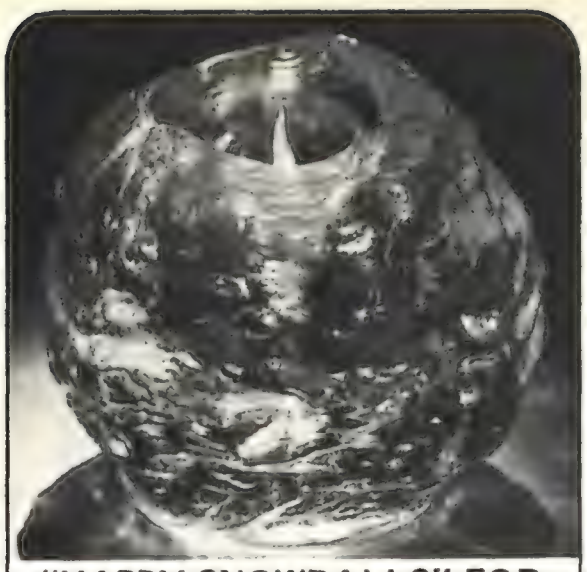
Congresswoman Shirley Chisholm celebrates the ninth birthday of the museum and inaugurates a new minority women's speakers program. Her speech is open to the public, September 15 at 7:30 P.M. For information, call 381-6731.

Hirshhorn Museum and Sculpture Garden

The first retrospective exhibition of works by John Covert opens September 16 in the third-floor galleries. Included are 27 works by this pioneer American modernist of the late Teens and Twenties. His well-known *Brass Band*, executed in 1919, is featured in the show.

Puppet Theater

Please note that the theater, located in the Arts and Industries Building, is closed for the month of September.



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By Stancil E. D. Johnson, M.D.

A slightly slanted pitch on Frisbees

The ball and the Frisbee, sport's two major forms, evolved from a common ancestor—the rock. Early rock athletes were divided into two camps: throwers and skippers. Throwers liked fat, hunky rocks, something they could get a grip on, and skippers[1] liked the smooth, flat, skinny ones for "pittying" on the pond. But there was something about rock throwing that seemed to bring out the aggressiveness of its people. Before long they were throwing at each other.[2] The skippers, on the other hand, were a more esthetic group. Sometimes they didn't even bother to count the pitty-pittys. It was the beauty of the flight that turned them on, these forefathers of Frisbee.[3]

Before long the throwers grew tired of pummeling one another and began picking upon their placid brothers. The war was on. The skippers went quickly into hiding.

Meanwhile, great things were happening in the evolution of the ball. One day, a thrower type on the wrong end of a toss raised his hands to protect his head and the rock lodged in his mitts. Catching was discovered! A lighter model was badly needed. Dried skulls and giant seedpods were tried, and then the breakthrough was discovered: animal bladders, which, let's be honest, is about as far as the ball has gone.[4]

The bouncing,[5] catchable ball just about ruined stone skipping. There was hardly a ripple at the old ponds. If it hadn't been for a chance happening in the late Pleistocene period, the element of flight in sport might have been lost forever. A Magdalenian lady named Frizzy Headrock sailed a pumpkin-gourd plate at a curious beast sniffing her cooking. Her aim was high, the flat, round thing soared right out of her cave, over the canyon, and into the residence of one Joe Behemoth, a local bladder-ball hero. Joe was fascinated with Frizzy's toss and sailed the gourd back, screaming her name in delight, "Frizzy, Frizzy, Frizzy!" Canyon folk stared in amazement as Frizzy and Joe exchanged tosses. Ms. Headrock never threw again but Joe dedicated his life to perfecting the flying gourd. His last model, with the outer edge tucked in toward the center, was posthumously called the Frizzy-Behemoth, or simply, the Friz-B.

The Frizzy-Behemoth crowd were eager to take their place in the arena of Paleolithic sport. But the aggression and greed of the old ball-gamers reappeared. The ball establishment publicly pooh-poohed the idea of a flying vegetable of any kind, and banned gourd-flipping from their ball fields. Once again, flying-disk sport took a back seat and waited.

The disk people didn't sit on their hands for the next several millennia. They kept trying to get in the game one way or another. Take the Greek discus: it was really a double convex, overweighted flying disk designed to let the gourd flippers get in some Olympic glory. Quoits and hoops—innocent-looking children's games? Look again. They were both disguised flying disks with the centers removed. Quoits and hoops were the little leagues for future disk champions. And hockey was supposed to be a flying disk game, but the puck got too chilly and the whole slippery mess degenerated into a stick game.[6]

Joe's descendants knew that to battle the ball they needed a better disk. Over the years they flipped every round thing they could get their hands on. In the late Victorian era, Yale college students took to tossing the pie tins of a local bakery.[7] The metal Friz-B was good but it lacked something: catchability for one thing. Then in 1947, it happened; two Californians, Fred Morrison and the late Warren Francioni, made a flying disk out of plastic. What the bladder did for the ball, plastic did for the disk.

The 20th-century ball, sick with the illness, commercialitis, and sterile from overexposure to cathode

rays, could no longer oppose the disk. Holding their *Discus plasticus* high, Friz-B players came out of hiding and organized a worldwide organization, the International Frisbee Association. Another group is pushing for *official* inclusion in the Olympics. Colleges are offering credit courses in Frisbee, and that true harbinger of seriousness, the collector, has appeared. A Bostonian, John Kirkland, who has more than 1,300 combinations of colors of plastic flying disks in his collection, recently paid $57 for a disk.[8]

New Frisbee games have sprung up, such as Ultimate, Guts, Circle and Dog-Bee. Many of the old ball games are being reworked with a disk into variants such as Basebee and Folf. Golf plays so much better with a flying disk. Sans the hostile stick and the silly little white "rock," the real journey-essence of the game appears.

The long and bitter war between the ball and disk appears over. The golden age of the flying disk is with us at last, in time to bring esthetics to athletics and return play to sport. And not a moment too soon.

FOOTNOTES[9]

1. The first recorded stone skipping occurred in 200,001 B.C. when Hank Scale sailed one across the Tuzla Su, a tributary of the Upper Euphrates, left bank to right.
2. Heidelberg man made a regular game out of this, called "Splatt." They played with hundred-pound "balls" and awarded one point for direct hits. The games were generally low scoring.
3. Frisbee is a trademark name for plastic flying disks made by the Wham-O Manufacturing Company. Wham-O apparently borrowed (but misspelled) the bakery name, thinking it was the origin of the name. See footnote 7.
4. The substitution of air for urine came surprisingly late, circa 18,012 B.C. Many feel this was the greatest single development in the history of the ball.
5. Refer to footnote 4 for a quick insight into the origin of the term *dribble.*
6. The ball had some backfires, too. The Minoans were all set to get into sport in a big way, but they mistranslated the word *ball* from an Egyptian sports magazine.
7. The Frisbie Pie Company of Bridgeport, Connecticut, founded 1871. Curious situation here. The name Frisbie derives from the ancient Danish tribe, Frisby. *Fris* means stone, *by* means on or over the river. These Frisbies must have been stone skippers. More research needed here.
8. A 1949 red Pipco crab—a very rare pre-Wham-O, Morrison-Francioni, hard-shell plate made of butyl stearate plastic.
9. SMITHSONIAN seldom uses footnotes.

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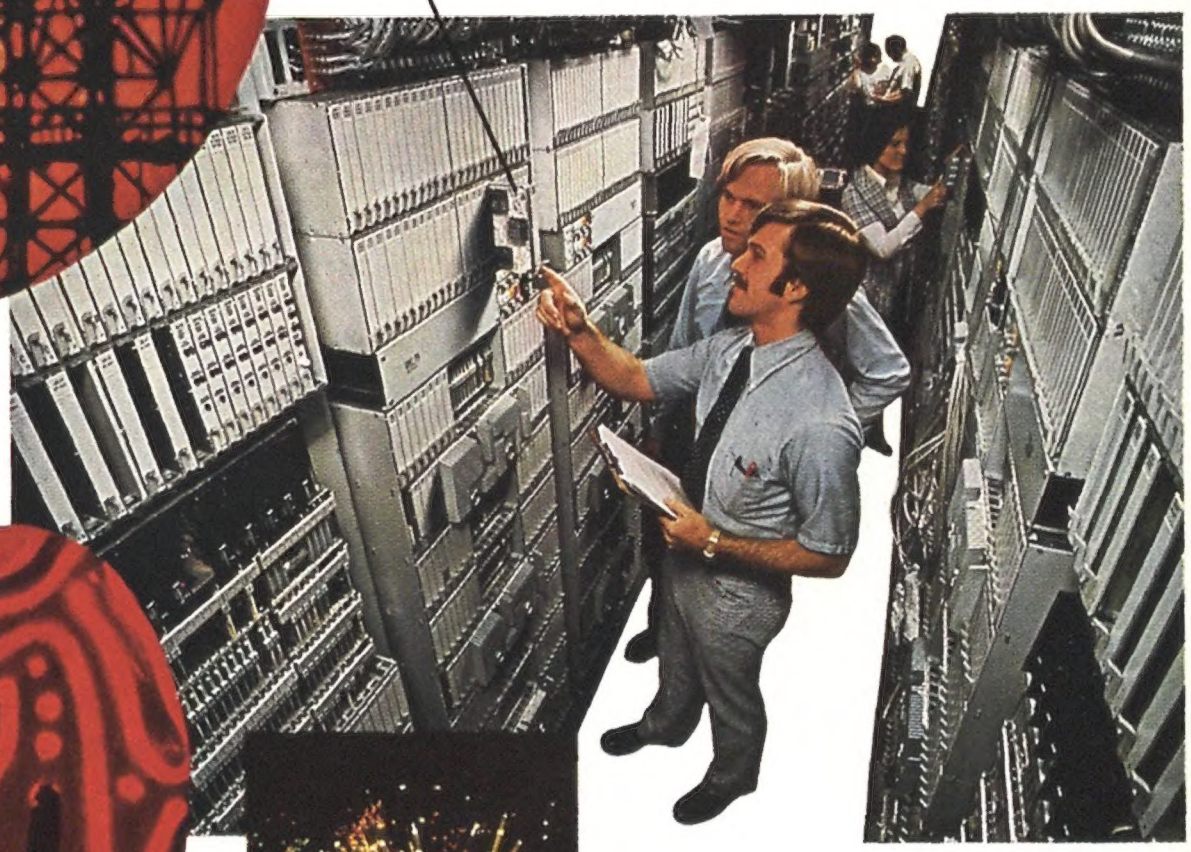

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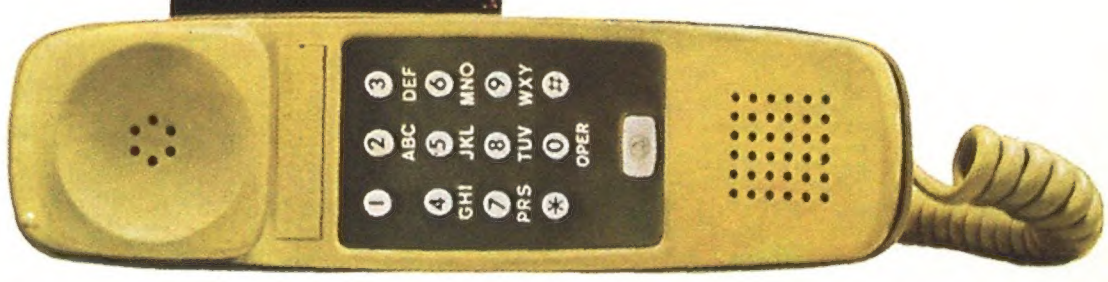

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Mircea, Romania (background)

Juan Sebastian de Elcano, Spain (middleground)

Christian Radich, Norway (foreground)

With hand-held camera and long lens,
George Silk composed this panorama of sail.
Exposures are one-fourth of a second apart.